COAL AGE

JANUARY 1943

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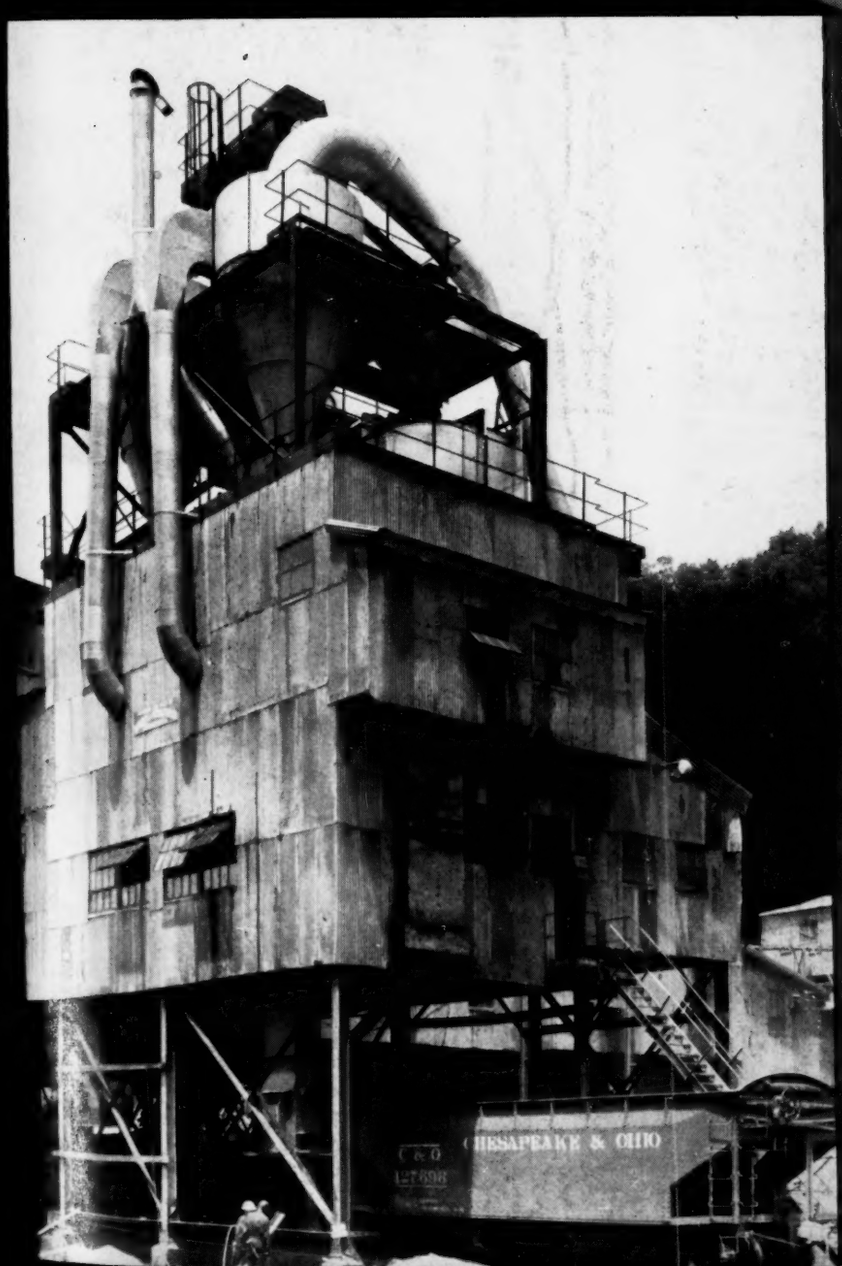

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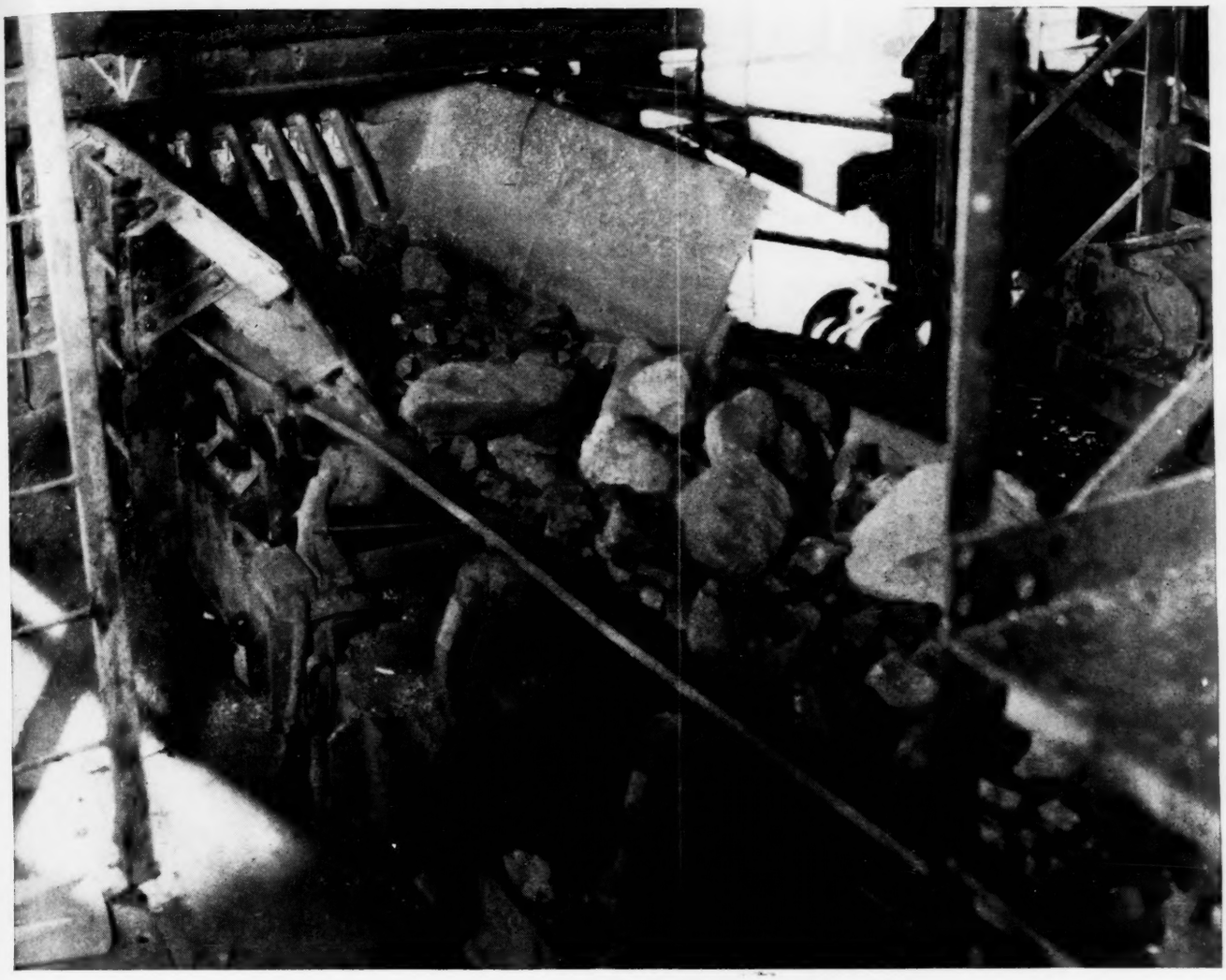

Can you answer these questions

on how to get the most out of rubber?

Question No. 1:

The point where the principal wear occurs on a conveyor belt is the place to be watched. Which of the following is that point?

a. At the end pulleys.
b. At the loading point.
c. Underneath the skirt boards.

Question No. 2:

Beyond what temperature will rubber belts start to lose important properties and deteriorate more rapidly?

a. 180° F.
b. 150° F.
c. 120° F.

Question No. 3:

What is the biggest single cause of premature belt failure?

a. Improper loading conditions.
b. Failure to make repairs when needed.
c. Running belt too fast.
d. Overgreasing of idlers.

Question No. 4:

More than half of premature hose failures in industrial plants are caused by which one of these?

a. Trucks running over it.
b. Contact with oil, grease or acid.
c. Improper fittings or incorrect application of fittings.

Answers:

1. c. Underneath the skirt boards. Correct placing of the boards (and correct spacing of idlers which affects the efficiency of skirt boards) can reduce belt wear as much as 50% and so double belt life.

2. b. 150°.

3. b. Failure to make repairs when needed. Cuts, gouges, even slight damage lets moisture, acids, mildew, dirt get into fabric plies and so weaken the fabric that a sudden blow may break the belt. This damage can be eliminated and longer belt life assured, by making repairs with the B. F. Goodrich vulcanizer method, as soon as any damage occurs.

4. c. Improper or incorrectly applied fittings—although many other practices such as a and b contribute to shorter hose life.

The answers to many other questions on Industrial Rubber care and maintenance are included in a series of seven folders prepared by B. F. Goodrich to help you get the most out of rubber. Write for them today—and for repairs, salvaging and the B. F. Goodrich endless belt service, call your nearest B. F. Goodrich distributor — or write to *The B. F. Goodrich Co., Industrial Products Div., Akron, O.* Rubber is vital—help save it.

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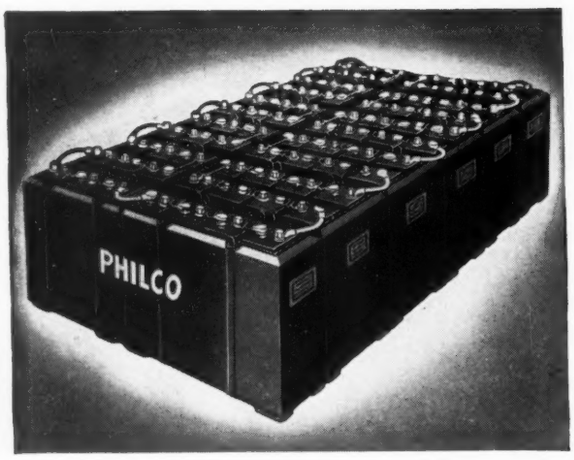

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CONTENTS

VOLUME 48 JANUARY, 1943 NUMBER 1

COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, Coal Age, 330 West 42d Street, New York, N. Y.

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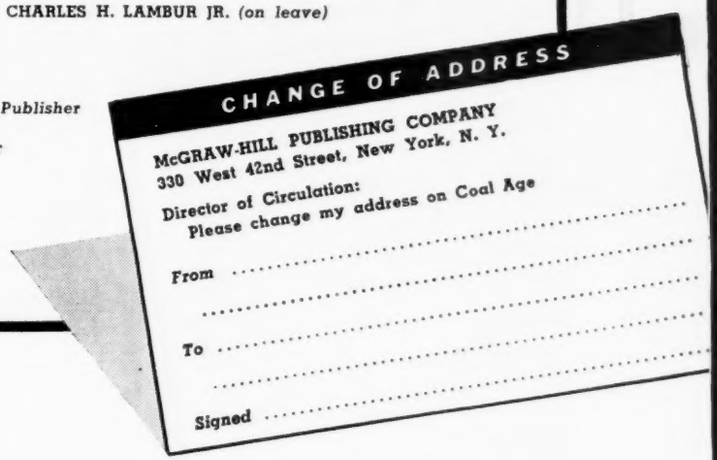

PROGRAM NOTES—COMING ATTRACTIONS

• WHAT happened in coal mining in 1942 and what are the future prospects of the industry? That is the question in the back of everybody's mind and will be the theme of the February annual review and outlook number of Coal Age, now in preparation. Basic material will be a review of technical and operating developments during the year, including data on new techniques, new equipment, new operations and other activities in mining, preparation, electrification and maintenance. A feature will be a review of sales of mechanical-loading equipment.

• Forecasts of developments on the vital man and materials fronts will be a second major theme of the February issue. Scheduled are statements by competent government representatives on the materials and equipment and manpower outlooks for 1943 and the more distant future. These authors have been urged to tell all.

• Research and other preparations for the future, especially the future following the war, now are very much to

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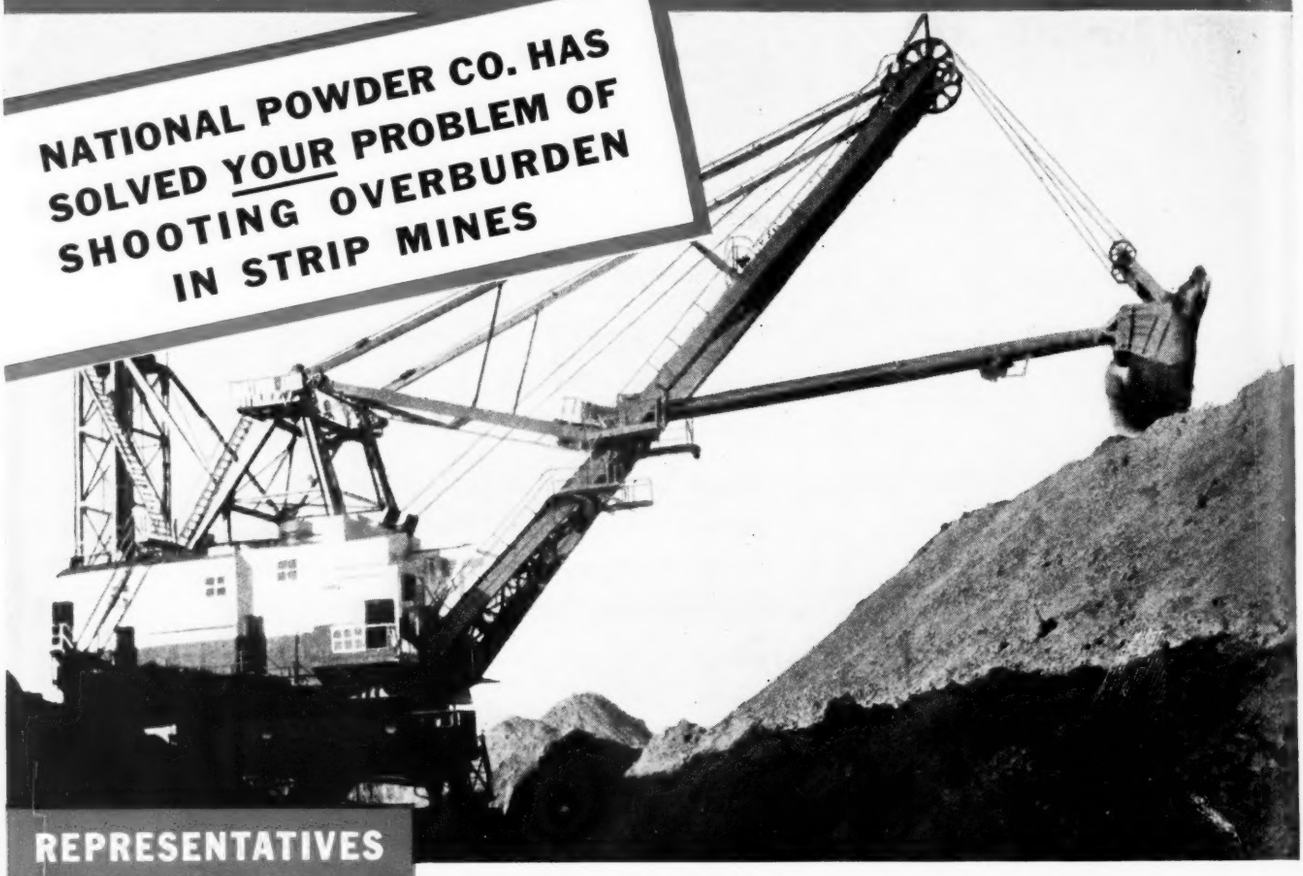
NATIONAL POWDER CO. HAS SOLVED YOUR PROBLEM OF SHOOTING OVERBURDEN IN STRIP MINES



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Evidence of the effectiveness of these new Powders is found in the tangible testimony of Strip Mine Operators themselves. Though introduced only this year, more than 1,000,000 pounds of "Slim-ite" Powders have been used in stripping operations.

REFER TO OUR ADV. ON PAGE 22 OF COAL MINING CATALOGS

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MANUFACTURERS OF HIGH EXPLOSIVES FOR ALL INDUSTRIAL PURPOSES

the fore. February will stress this phase of coal-mining operations with a review of research projects under way and a feature article specifically on the prospects for liquid fuel from coal. This material will be reinforced by other data on distribution and utilization problems and prospects.

• Safety is another subject for thorough-going treatment in February, with articles scheduled on progress and developments in 1942, with significant trends, and on the operation and accomplishments of the federal inspection system and other safety and security activities of the Bureau of Mines and the coal-mining industry.

• Highlights only, the preceding remarks do not cover a wealth of other review and forecast material. The theme of the February review issue, to repeat, is to tell what has happened and forecast the developments of the future.

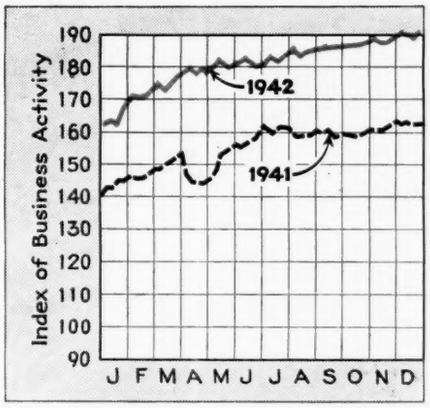
• Turning to the present issue, it also carries a wealth of feature material on coal-mining problems and operation, in addition to the foremen's questions and answers, operating ideas and manufacturers' departments and the news and editorial sections. Leading off is a description of how the installation of dust-separating equipment new to the coal industry made possible the air cleaning of fine coal at the Wayland (Ky.) plant of the Elk Horn Coal Corp. (p. 49).

• Safety is a major feature of this January issue. R. V. White (p. 55) tells of the work of the War Production Fund to Conserve Manpower; R. J. Brennan and Thomas Coneby throw light on the supervisor's role (p. 57); and Walter Dake describes the significance of the new injury report form of the U. S. Bureau of Mines (p. 58).

• How to handle the problem of materials reclamation at coal mines is the subject of a short but pointed article by George F. Bieler, Daniel Green and Joseph Kyle, of the Snow Hill Coal Corp. (p. 53). A second preparation feature is built around the new Schuyler Coal Corp. plant, using coal-washing tables, in Illinois (p. 62).

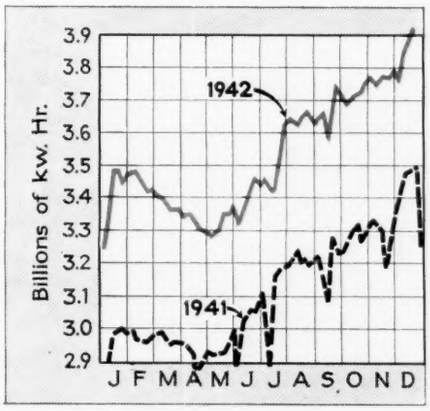
• A method of conveyor mining designed to reduce area in production, increase efficiency and cut the quantity of materials in service is offered by H. D. Sedinger (p. 62). J. H. Dickerson continues his ventilation series with an article on how splitting improves air circulation with safety and economy (p. 65).

HOW'S BUSINESS



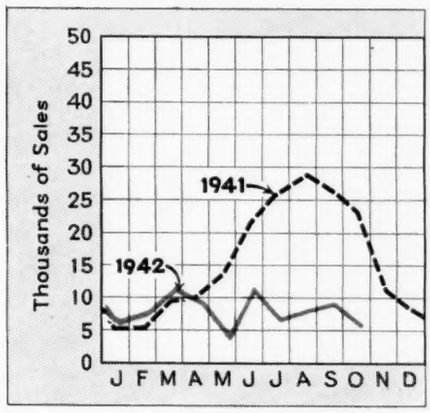
GENERAL BUSINESS CONDITIONS

Plateaus in business activity such as that of the last five weeks, when the Index held steady between 190 and 191, says *Business Week* (Dec. 19), are to be expected more often in the future, though for the next few months they will be only temporary. Large gains are due in the first half of 1943, with the Index crossing the 200 mark; by midyear it may run over 210. Thereafter, activity will tend to level off. By then, planned expansion of war material production capacity will have largely been completed.



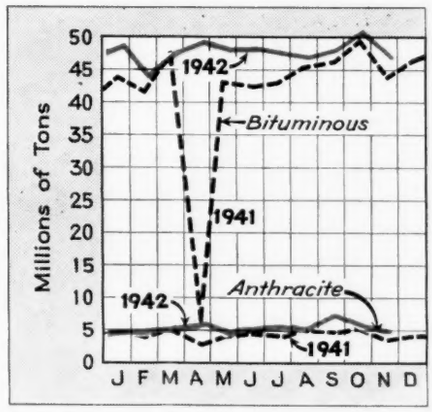
ELECTRIC POWER OUTPUT

Production of electric energy by the electric light and power industry during the week ended Dec. 12 continued the gains which, with only two recessions, have held since the first week in October. Output of power for that week totaled 3,937,524,000 kw.-hr., according to figures by the Edison Electric Institute, an increase of 13.3 percent over the corresponding week of 1941. Figures for other recent weeks are: Nov. 21, 3,795,000,000 kw.-hr.; Nov. 28, 3,766,000,000; Dec. 5, 3,883,534,000 kw.-hr.



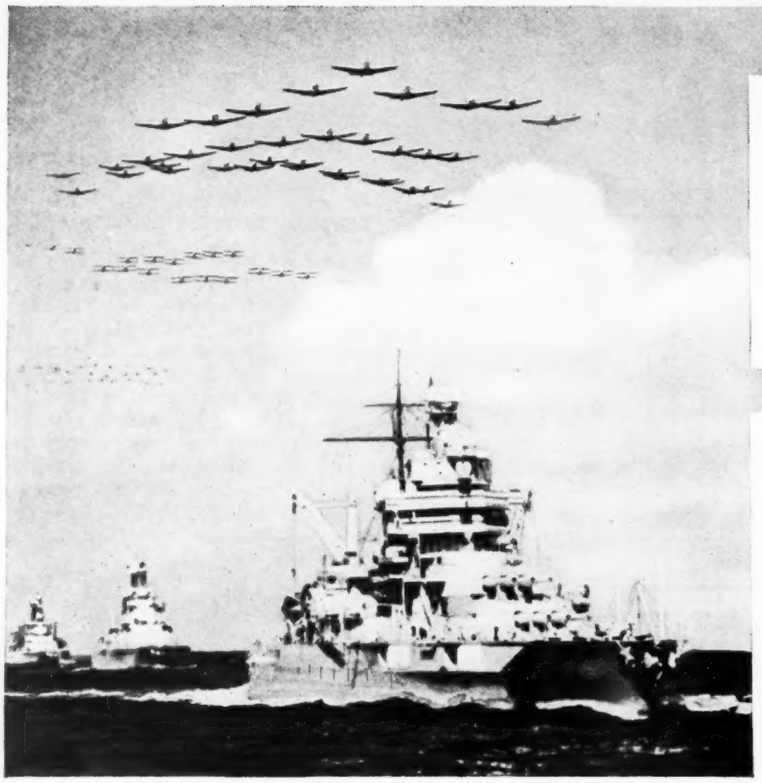
COAL STOKER SALES

Sales of mechanical coal stokers in the United States in October last totaled 5,986 units (U. S. Bureau of the Census from 91 manufacturers, only 60 of whom reported sales during the month), compared with 9,086 (revised) in the preceding month and 23,289 in October, 1941. Sales of small units in October last were: Class 1 (under 61 lb. of coal per hour), 4,387 (bituminous, 3,297; anthracite, 1,090); Class 2 (61-100 lb. per hour), 548 (bituminous, 494; anthracite, 54); Class 3 (101-300 lb. per hour), 613.



COAL PRODUCTION

Bituminous coal produced by United States mines in November last (preliminary) totaled 46,800,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior. This compares with an output of 51,065,000 tons in the preceding month and 44,426,000 tons in November, 1941. Anthracite tonnage in November last, according to the U. S. Bureau of Mines (preliminary), was 4,795,000, as against 5,101,000 in the preceding month and 3,832,000 tons in November, 1942.



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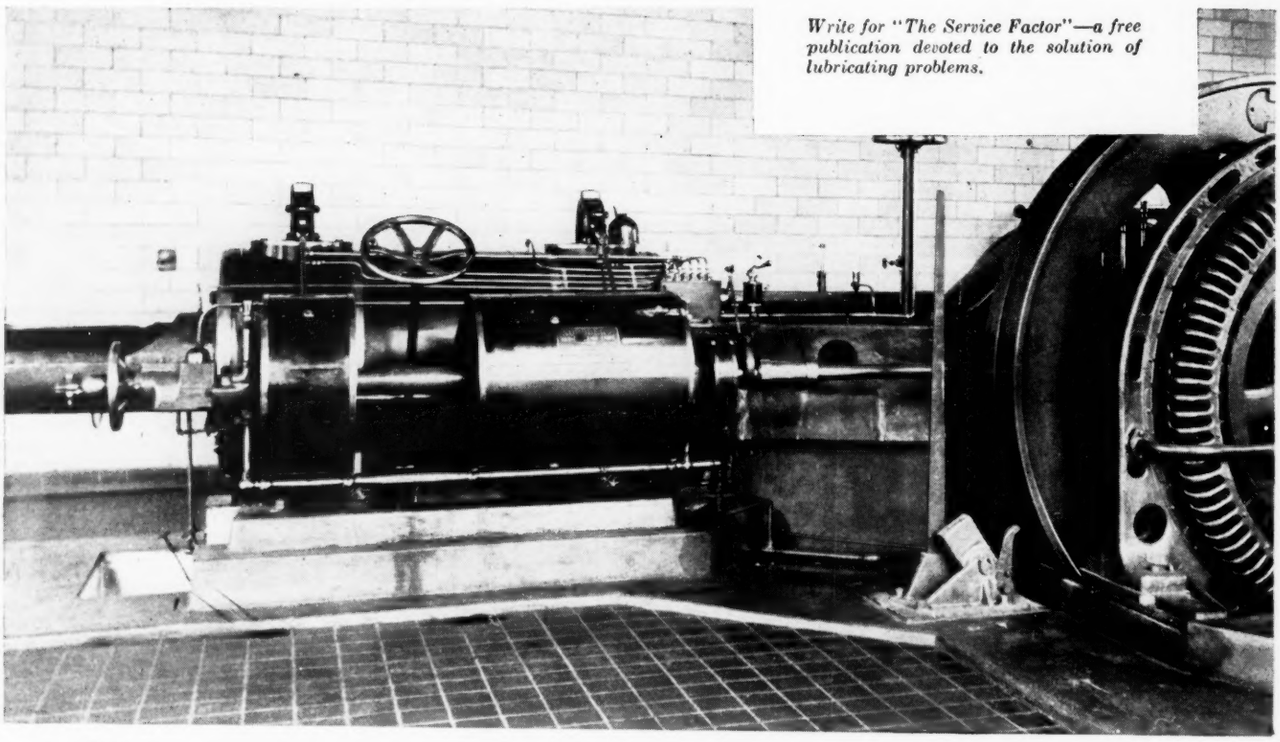

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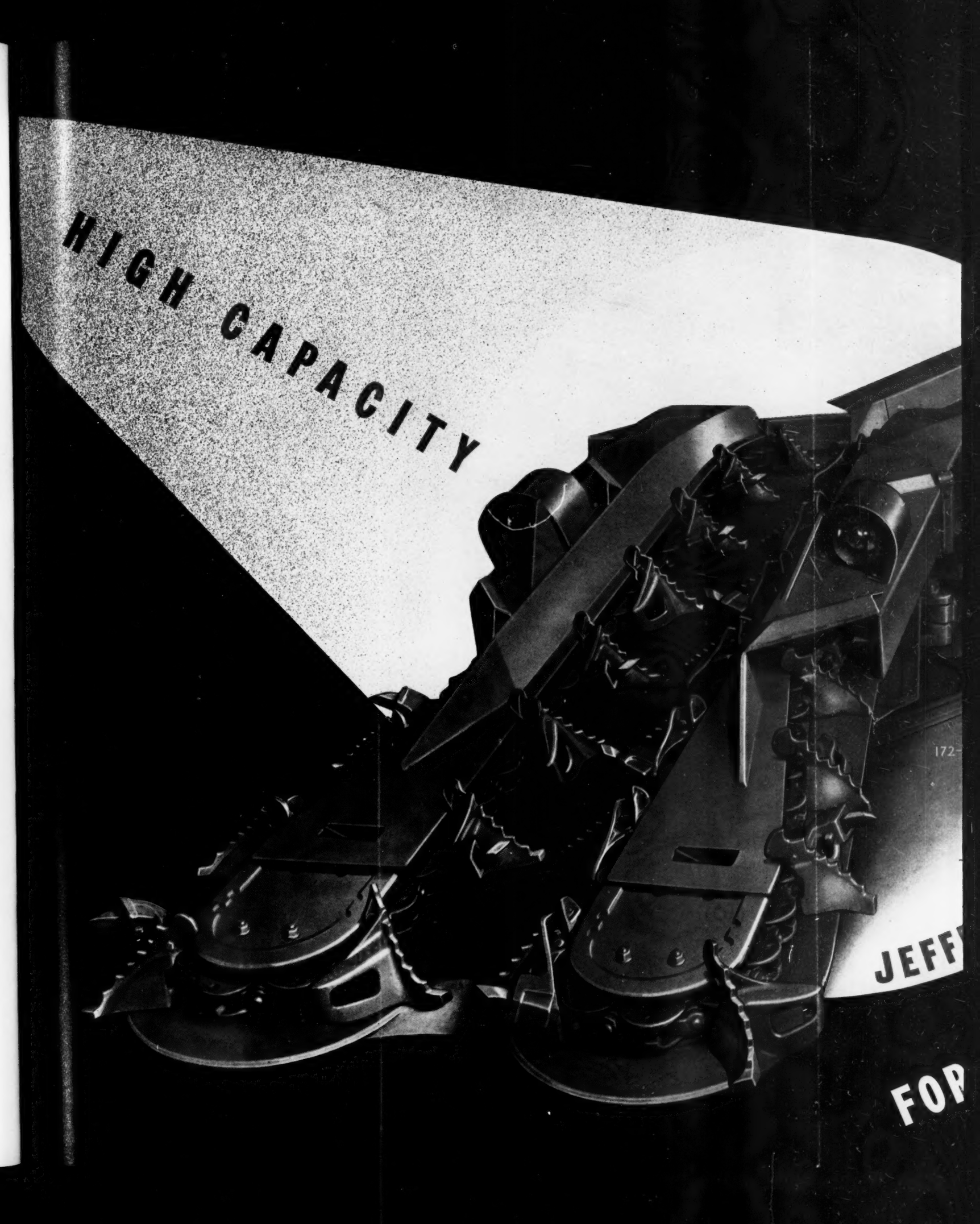
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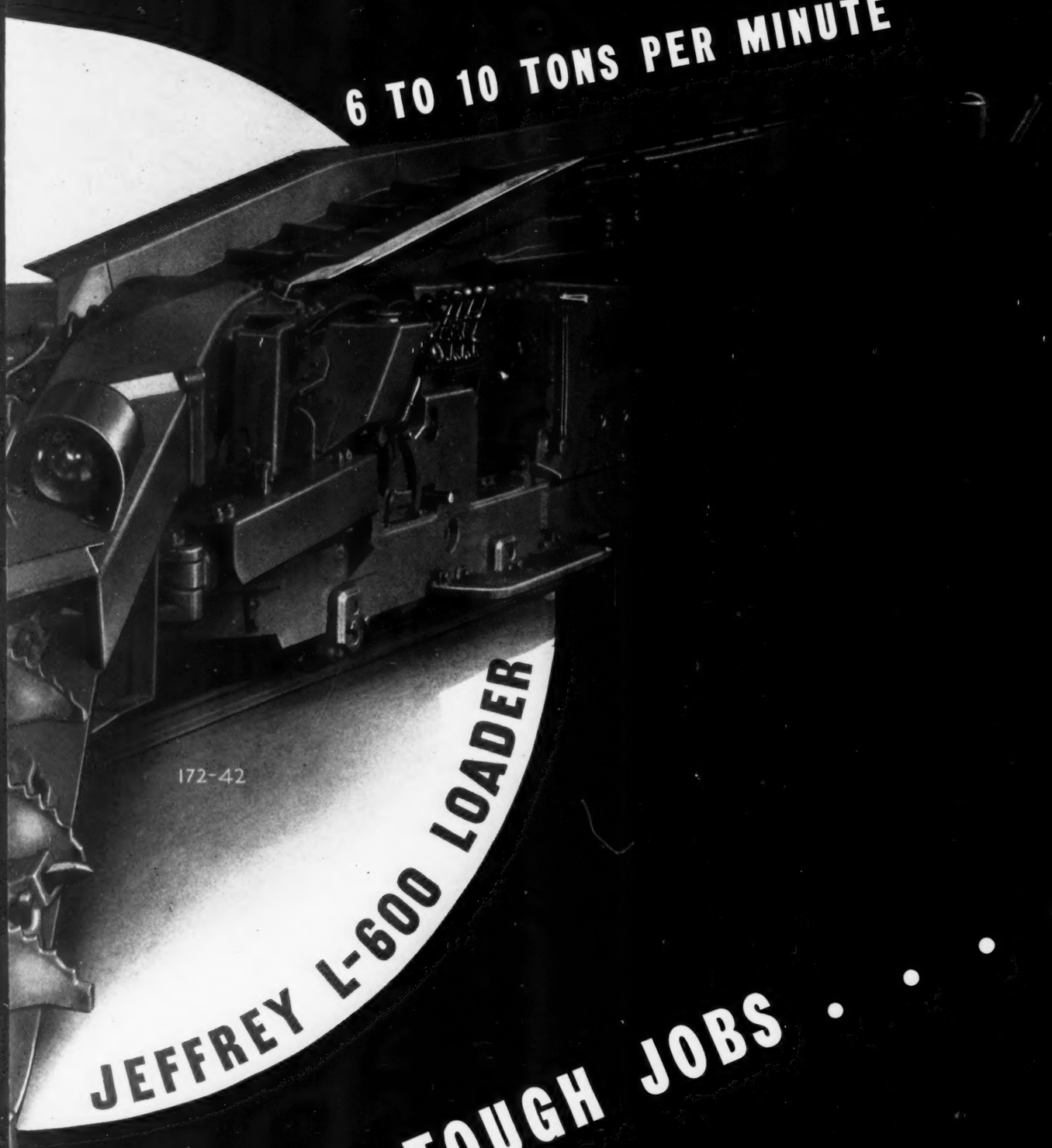

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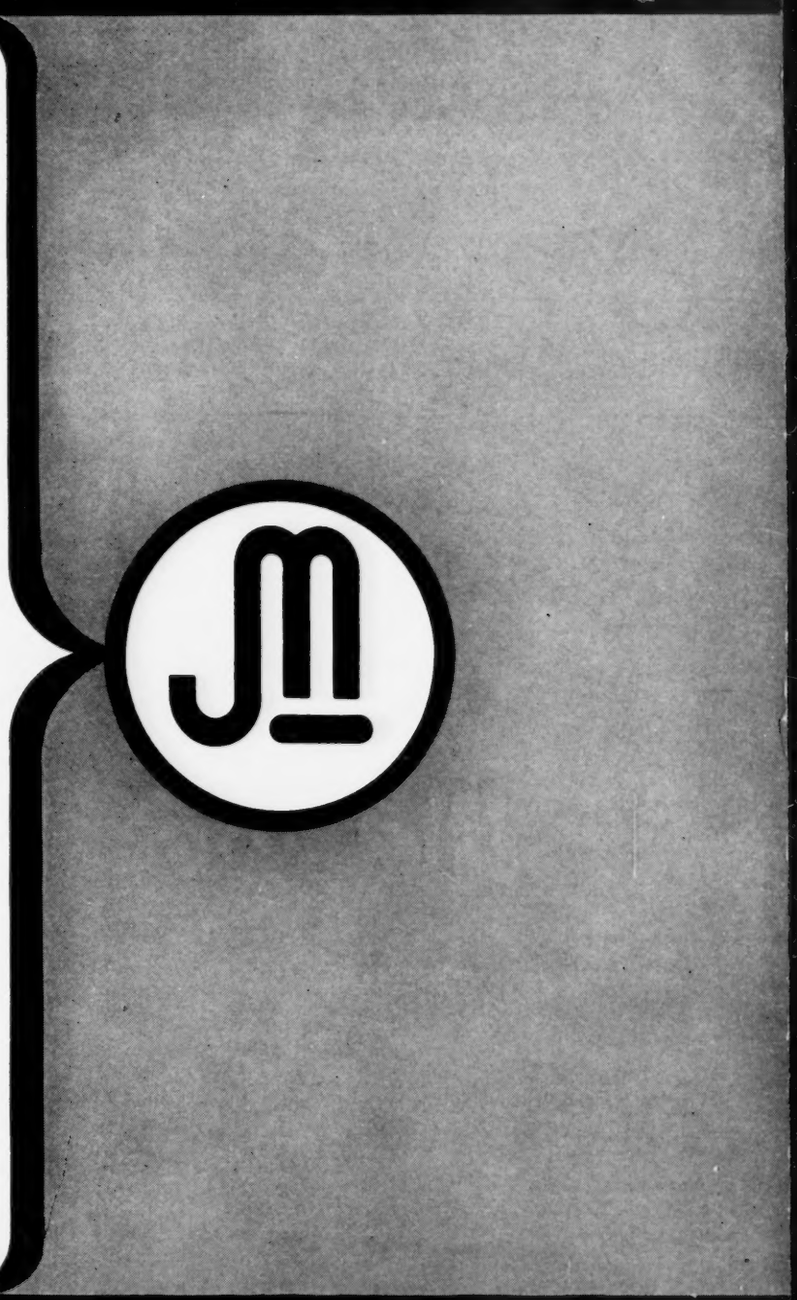

BELOW AND ABOVE GROUND
FROM FACE TO RAILROAD CAR

LOADING MACHINE MAINTENANCE HINTS . . . .

To get continuity of service and maximum production from your loading machines with the least time out for repairs.

1. KEEP THE LOADER CLEAN

At least once a shift, clean out coal that may lodge in such places as to restrict free operation of controls or chains. Once a week, using compressed air, remove all dirt and grease accumulations.

Remove motor inspection covers at least once a week. Check commutator—see that it is smooth and clean. See that brushes operate freely —replace when necessary.

Be sure that all electrical connections are tight in control and resistance enclosures. Check contact fingers—see that they are smooth and make proper contact. Remove any accumulation of grease or moisture in motor and control compartments.

2. MAKE SCHEDULED INSPECTIONS

See that all chains are maintained with slack enough for free movement, but not enough to make chain sloppy and interfere with operation. As chains wear, take out links to maintain minimum possible operating length.

Do not allow equipment to operate with any covers or guards removed. Renew chain guides when worn or broken. Keep brakes and clutches in proper adjustment—do not set clutches too tight. A clutch too tight destroys the protection against shock loads inherent in a properly-adjusted clutch.

Watch cable reel adjustment for free operation and proper tension. Cable failures are particularly costly just now. If cable has temporary splices, replace with another one so that proper repairs can be made to the cable removed.

3. LUBRICATE AT REGULAR INTERVALS

At frequent intervals, check hydraulic system for leaks. Use clean oil and do not get water into hydraulic system. Clean out screens and filters once a week. Keep oil level up in oil tank and transmission case. Keep pressure fittings in good shape—use grease gun as often as lubrication chart indicates. Cheap oil is a short cut to trouble. Use grade of oil for service required as specified in Chart 734-A. Lubricants and lubricating devices should be handled so they do not become contaminated with foreign matter.

4. DO NOT OVERLOAD THE LOADER

It does no good to push a loader up against a face of coal that is not shot properly. More time is lost than gained in digging down a standing shot—excessive wear and tear on clutches, chains and electric system makes this practice an expensive luxury.

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PLENTY OF DIRT! BUT IT'S NOT IN THE BEARINGS

• THE eccentric bearings pictured here would never win a beauty prize, but they are tops for taking punishment—thanks to Superla Grease and the timely suggestion of a Standard Lubrication Engineer.

A step-up in coal production in a large Illinois mine started trouble. Eccentric bearings overheated. Grease melted and was thrown off, leaving them unprotected. That meant more overheating . . . more grease. Then, a Standard Lubrication Engineer made this suggestion: Try the high quality, heat-resistant bearing lubricant, Superla Grease. It is holding down this same job at many other mines.

These eccentrics were no exception. Bearing temperatures dropped as soon as Superla took over. There was no separation. Superla stayed in the bearings, keeping out dirt and trouble.

One of these Engineers may have a similar time and maintenance saving suggestion for you. Just write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for the Engineer nearest you.

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Great Western Coal Company

*INDICATES NUMBER OF MINES USING CARDOX METHOD

CARDOX CORPORATION

CARDOX

PENNSYLVANIA

Butler Consolidated Coal Company
Christopher Mining Company
Hillman Coal and Coke Company
Moffit Coal Company ..... (8)
Pittsburgh Coal Company ..... (2)
Edward Tomajko ..... (2)
Union Collieries
Westmoreland Coal Company

OHIO

Hanna Coal Company of Ohio ..... (3)
The Jefferson Coal Co.
Mine No. 6 Inc.
Warner Collieries Company ..... (2)

ILLINOIS

Bell and Zoller Coal and Mining Co. ..... (2)
Blue Bird Coal Company
Consolidated Coal Company ..... (2)
Franklin County Coal Corporation
Moore and Sons Coal Company ..... (4)
Old Ben Coal Corporation
Peabody Coal Company ..... (2)
Sahara Coal Company
Thermal Coal Company
Wasson Coal Company

INDIANA

Glendora Coal Company
Ingle Coal Corp.
Knox Consolidated Coal Corporation
Linton-Summit Coal Company
Standard Coal Company

IOWA

Jensen Coal Company
Scandia Coal Company
Shuler Coal Company

OKLAHOMA

Atlas Coal Corporation
Premium Smokeless Coal Company
Starr Coal Company

TENNESSEE

Pewee Coal Company
Francis Rex Coal Company
Block Coal and Coke Company

COLORADO

Alpine Fuel Company
Black Diamond Fuel Company ..... (2)
Boulder Valley Coal Company
Canon Black Diamond Coal Company ..... (2)
Canon Monarch Coal Company
Canon National Coal Company ..... (3)
Clayton Coal Company ..... (3)
Colorado Fuel & Iron Corporation
Consolidated Coal & Coke Company
Crested Butte Coal Company
Crow Bar Coal Company
Domestic Coal Company
Double Dick Coal Company
Giuliano and Sons Coal Company
Griffith Coal Mining Company
Imperial Coal Company
Liley & Merlino
Louisville Lafayette Coal Co. ..... (2)
McNeil Coal Corporation
National Fuel Company
Nu-Shaft Canon Coal Company ..... (2)
Oliver Coal Company
Rocky Mountain Fuel Company ..... (2)
William E. Russell Coal Company
Shamrock Coal Company ..... (2)
Victor-American Fuel Company

WYOMING

Colony Coal Company
Kemmerer Coal Company
Rock Springs Fuel Company ..... (2)
Sheridan-Wyoming Coal Company

UTAH

Barber Asphalt Corporation
Spring Canyon Coal Company
Standard Coal Co., Inc.
Uta-Carbon Coal Company

WASHINGTON

Roslyn-Cascade Coal Company

CANADA

Atlas Coal Company, Limited
Lethbridge Collieries, Limited
Red Deer Valley Coal Company, Limited
West Canadian Collieries, Limited
Western Gem & Jewel Collieries, Limited

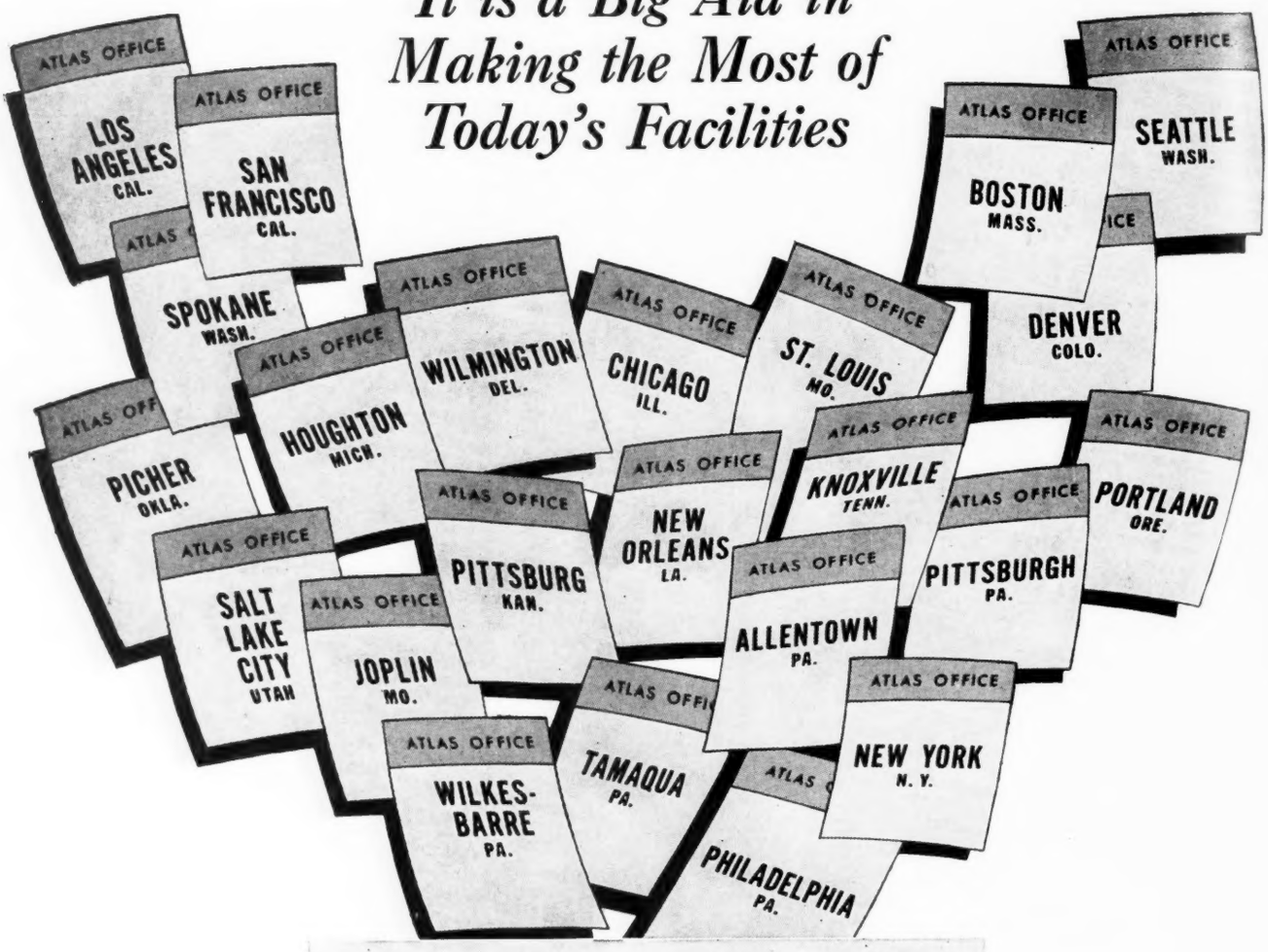
You, Too, CAN BENEFIT THROUGH THE USE OF THE CARDOX METHOD . . . WHY NOT FIND OUT NOW . . . A SURVEY AND TEST SHOTS CAN BE ARRANGED AT YOUR MINE WITHOUT COST OR OBLIGATION . . .

Write, Wire or Phone Today

BELL BUILDING • CHICAGO

When the Helping Hand is Near At Hand–

It is a Big Aid in Making the Most of Today's Facilities



ATLAS sales offices and distribution points are conveniently located throughout the country. There are ten explosives manufacturing plants located for efficient service. Atlas representatives are ready to aid in licking explosives problems, involved in construction, mining and quarrying. It is remarkable what cooperation can accomplish. Let the Atlas representative prove it to you.

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. · Offices in principal cities · Cable Address—Atpowco

Dimes protect dollars...

WITH

O-B Fused Trolley Taps

● It's a small price to pay! O-B Fused Trolley Tap protection costs but little in light of the expensive machinery and cables it safeguards—equipment replaceable only at the expense of vital war production. These simple, inexpensive devices prevent abusive overloading and eliminate cable burnouts. Available in several sizes and combinations, they can provide sectionalization at any point in your mine. For continuous production, install some O-B Fused Trolley Taps today. For every dime you spend, you'll safeguard many dollars of costly electrical equipment.

2368-M

For more detailed information on O-B Fused Trolley Taps, see page two of your December, 1942, Haulage Ways.

★ BUY WAR BONDS ★ ★

Ohio Brass

MANSFIELD, OHIO

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Pick Your

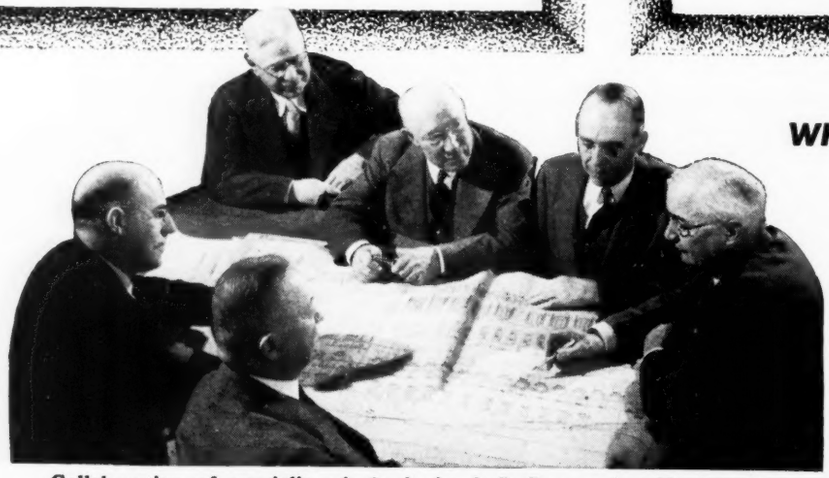
HERE ARE FOUR OF THE MOST PRESSING

Labor Shortage?

Does part of your process use men needlessly? Remember, mining is a machine industry!

Unexpected Breakdowns?

How many of your key machines were designed for 24-hour-day service? Good point to check today!



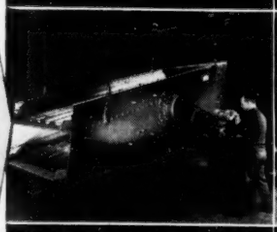
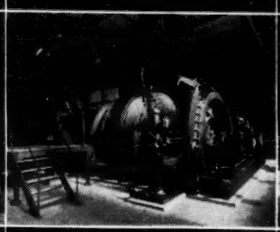
Collaboration of specialists is basic in A-C Cooperative Engineering.

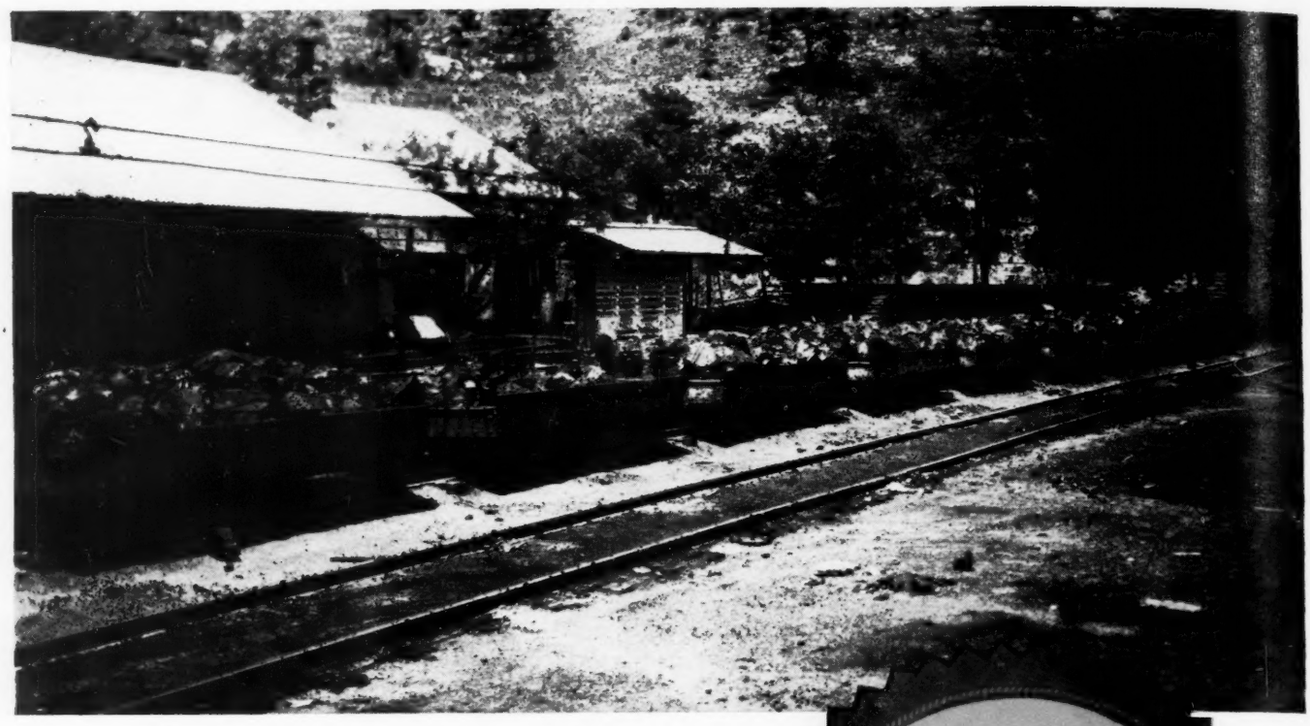
WHICHEVER IT IS — CALL

MEN must work together better than ever before to win this war... *and so must machines!*

If failure of machines to work together properly is at the root of your wartime processing problem, remember there's one company that *specializes* in making machines "team up"... Allis-Chalmers.

Only Allis-Chalmers Makes a Complete Line of this Equipment!

Vibrating Screens	Mine Hoists	Unit Substations	Turbines
			
Efficient separation and dewatering — 8 different types.	Completely automatic control with new "REGULEX" exciter.	Modern, factory-built units save space, copper, steel.	Steam & hydraulic. Line of power, electrical equipment.



Some of the 500 new Timken Bearing Equipped Four (Stub) Axle type Cars in service at the Hardy-Burlingham Mining Company, Hardburly, Ky. Capacity, 4-6 tons per car. Built by American Car & Foundry Co.

Equipment that is only partly equipped with Timken Tapered Roller Bearings is only partly protected against friction; wear; radial, thrust and combined loads; shock and misalignment.

That is a lot better than not having *any* Timken Bearings, of course, but it still is short of reaching victory performance standards. You won't realize the full possibilities of Timken Bearings until you install them at every suitable position—then you'll wish you had done it sooner.

Equipment designers who make full use of Timken Bearings give their companies a two-fold advantage—*better* machines and *better selling* machines; for no name in bearings makes such a strong appeal to buyers as "TIMKEN". The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

"All There Is In Bearings"

Step up the capacity of your mining equipment for speed, load and endurance; give it greater effectiveness for Victory. Use Timken Bearings throughout.

HELP ASSURE VICTORY

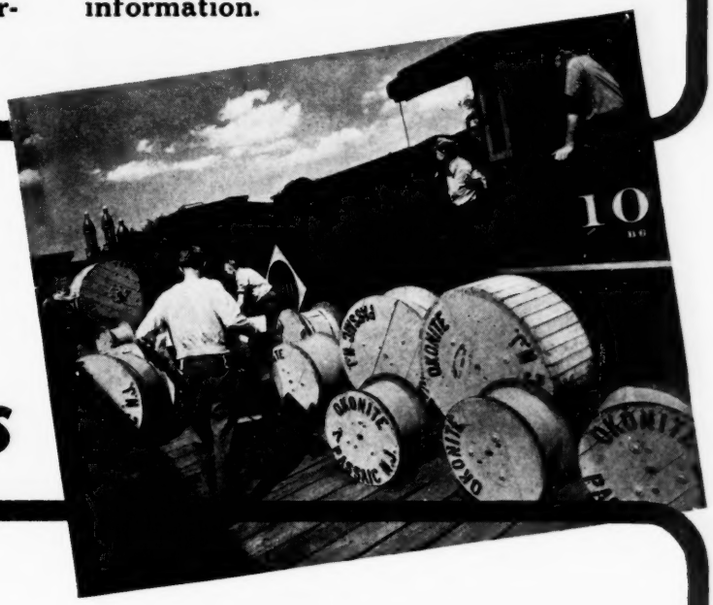
Buy War Bonds. Conserve Rubber. Eliminate Unnecessary Travel. Use the Telephone Only When Important. Salvage All Scrap and Waste Material.

All Timken Bearing production now goes into fighting machines. However, the Timken Bearings in your motor vehicles or industrial machines will see you through the emergency—and beyond it—if you make sure they are lubricated and inspected regularly.

DO:

- order your wire requirements as far in advance as possible, to allow time to apply for material allocations from the War Production Board. Consult with government engineers to check with their requirements before purchasing cable for a *governmental financed project.*
- avoid complicated splices and fittings. Your Okonite representative can tell you how to simplify installations.
- supply us with cutting lengths promptly as we cannot start manufacture, in most cases, until we have this information.

To Expedite Shipment of Wires and Cables

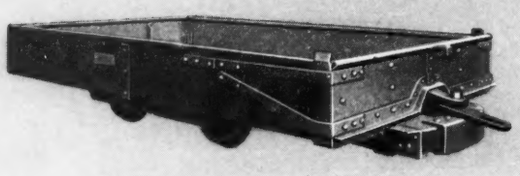


DON'T:

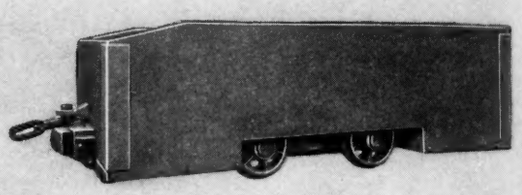
- specify cables that are unnecessarily complicated. Each operation on a cable requires special machines, any one of which may be cause of delay. Keep your cable design simple. Consult your Okonite representative as to how you can do this.
- order short lengths of many sizes. Standardization on a few sizes almost always results in lower cost per foot and much quicker delivery.
- send your order in without specifying End Use, conditions of installation, preference rating, priority authorization, army, navy or other governmental contract number, if any. This information is necessary in order to secure permission to manufacture.

THE OKONITE COMPANY 3190
THE OKONITE-CALLENDER CABLE CO., Incorporated
HAZARD INSULATED WIRE WORKS DIVISION
Executive offices, Passaic, N. J. • Branch offices in principal cities
Salvage Your Scrap — Buy U. S. War Bonds

the Cars behind the Guns...



A.C.F. FOUR-AXLE MINE CAR



A.C.F. LARGE CAPACITY MINE CAR

A.C.F. LARGE CAPACITY DROP-BOTTOM MINE CAR

A.C.F. FOUR-AXLE MINE CAR

THE MINE CARS OF AMERICA!

If these mine cars falter, our guns falter! Keep your mine cars working at top capacity. Watch them as never before, to head off every preventable breakdown or delay. Watch the lubrication of your wheels. When loads and/or speeds increase above a certain point, all plain and self-oiling wheels will wear out in the hub, no matter how well they are lubricated. Modern a.c.f. trucks with anti-friction bearings will meet the speed-up the war demands — and will give you efficient equipment for years of later use at a great over-all saving.

A few new parts can often work wonders. We can supply needed new wheels, trucks, axles, bumpers, and electrically welded end sill construction with spring bumpers. Delivery of complete cars depends upon receipt of materials. Our entire organization and manufacturing facilities are at your service to aid you to mine your share of the more than 600,000,000 tons of coal that will be needed in 1943!

a.c.f.

AMERICAN CAR AND FOUNDRY COMPANY

New York • St. Louis • Philadelphia • Berwick, Pa.
Cleveland • Chicago • Pittsburgh • Huntington, W. Va.

FOR VICTORY
BUY
UNITED STATES DEFENSE
BONDS
STAMPS

a.c.f. Chilled Tread Mine Car Wheels, as manufactured under our heat-treating process, are made from a special mixture of metals—better for mine car wheels than steel or iron, alone.

The Worst Hauling Conditions bring out the Best in Walter Tractor Trucks

THE tremendous power, traction and ruggedness of Walter Tractor Trucks show to great advantage on the steep grades, sharp turns and soft, slippery surfaces encountered in strip coal mining. A powerful 150 h.p. Diesel engine, plus the positive four-wheel traction of Walter 4-Point Positive Drive, enable these giant units to haul 25 to 40 tons in single trailers—up to 55 tons in double trailers . . . and keep going under conditions that would stop anything else on wheels.

Patented automatic locking differentials proportion the power to each of the four driving wheels according to its traction at any instant. Suspended Double Reduction Drive provides greater gear capacity, higher ground clearance and less unsprung weight (a factor in tire conservation). Powerful brakes, short wheelbase, correct weight distribution assure safe, easy handling and maneuvering under severest running conditions. Write for detailed information.

WALTER MOTOR TRUCK CO.
1001-19 Irving Ave., Ridgewood, Queens, L. I., N. Y.

Cut Out The "Strip Tease"!

Baker Gradebuilder cleaning off top of Brazil Block vein—view at Big Bend Collieries, Inc., Centerpoint, Indiana.

In strip mining, there's no fooling around when Baker Hydraulic Bulldozers are on the job—you get right down to business. They speed shovel loading, eliminating frequent re-spotting of shovels. They clean up pit floors, readily breaking out tough slate and shale. Too, they build truck ramps, level slack piles and cut corners on other construction and clean-up operations.

Baker Hydraulic Two-Wheeled Scrapers dig at a flat angle, requiring less drawbar power and loading faster. They dump clean, spread or pile. Made in 3, 4 and 6 yard capacities. They speed stripping when a large volume of flat overburden is encountered.

The Baker's direct hydraulic lift and down pressure take the "tease" out of stripping. In crowding, over half the weight of the tractor is exerted on the blade—it does not depend on the weight of the blade alone. That's why Bakers hog out bigger loads. They have a greater moldboard surface area, too. And Baker Bulldozers are interchangeable with Gradebuilders; change-over can be made in a matter of minutes.

No wonder so many strip mine operations—and underground mines, too—are increasing tonnages of much needed coal with Bakers. May we send you a copy of "Unsung Heroes of War"? Tells about Baker Bulldozers' place in the war and how Baker originated the first hydraulic bulldozer.

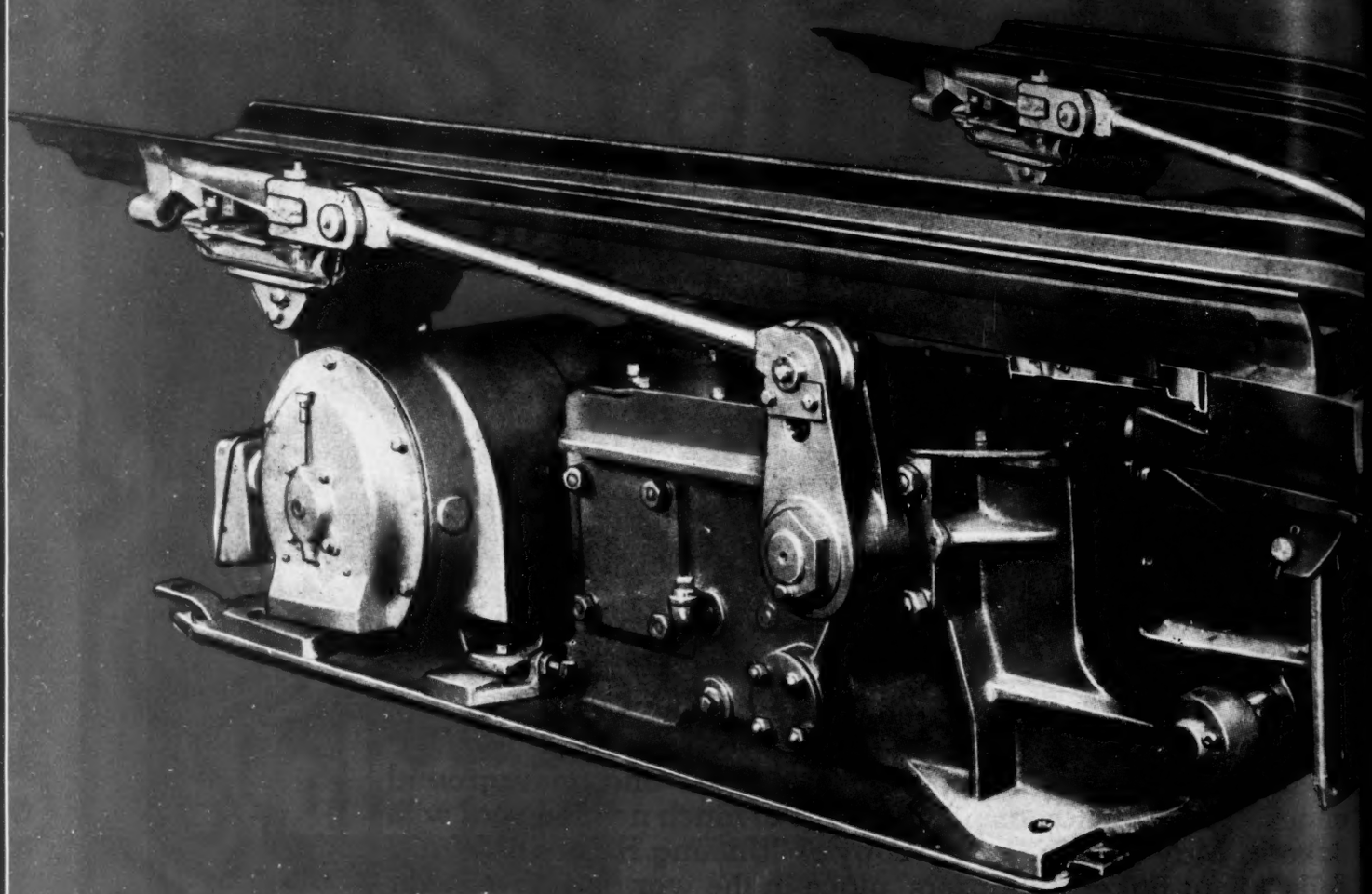
THE BAKER MFG., CO.
514 Stanford Ave., Springfield, Ill.

BAKER *The Modern Tractor Equipment Line for*
EARTH MOVING
LEVELING AND GRADE BUILDING
SNOW REMOVAL
ROAD MAINTENANCE

The GOODMAN *Shaker*

. . . wide range of application
. . . can be suited to specified conditions

Hundreds of installations in coal and metal mines convincingly demonstrate the ability of Goodman shaker conveyors to meet the exacting requirements of mechanized progress and provide increasing benefits as application is extended.



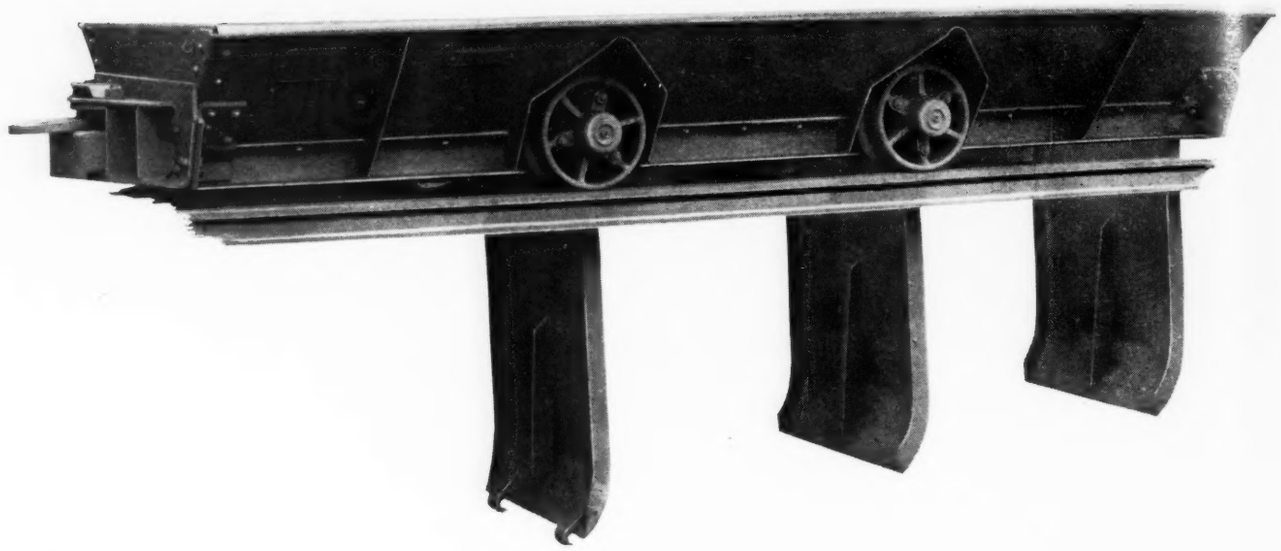
GOODMAN MANUFACTURING COMPANY

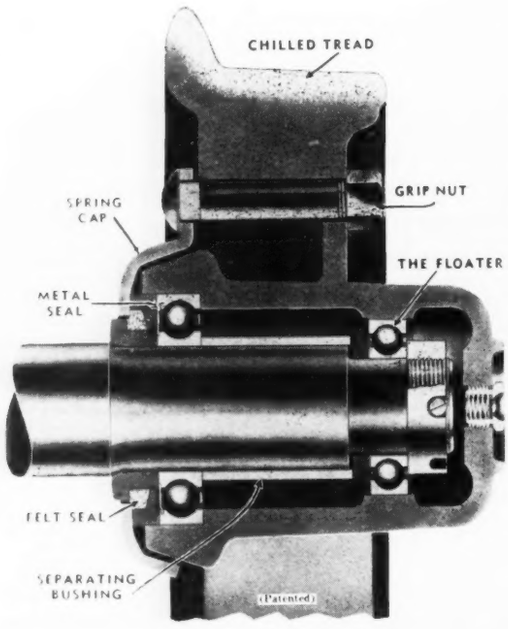
r Conveyor SYSTEM

Three-panel production on five-entry system using Goodman Duckbill Shuttles and Belt Conveyors.

HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

SANFORD-DAY...





★ ABOUT S-D WHEELS—

For over 40 years, we've been making car wheels of every conceivable type. Yet, we still find men who overlook the vital importance of wheels to profitable operation in mining.

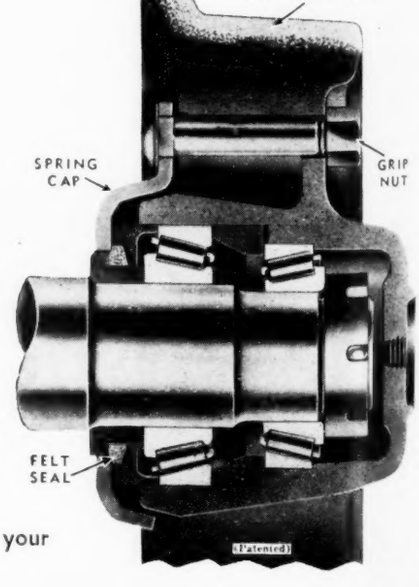
We know of operators who never give a thought to wheels until a car truck breaks down. When, if the performance facts were known, they would realize that all of their trucks already are virtually broken down. Such cases mean extremely expensive leaks, resulting in lost production and high maintenance costs.

Constant work in improved design and construction of S-D wheels has provided mining with the most perfect and most economical precision wheels the industry has ever known. That's why wide-awake operators have thousands of S-D Precision Bearing Wheels in use today. Value in money saved has made the S-D "Floater" the industry's best known wheel.

TWO REMARKABLE WHEELS!

The sectional view at left shows our famous S-D "Floater" Ball Bearing Wheel—the easiest running mine car wheel we know of. Independent engineers' tests prove that haulage capacity of locomotives can be increased up to 50 per cent when cars are equipped with "Floaters", as compared with wheels equipped with other types of precision bearings.

Shown at right is our latest prize—the S-D Timken Bearing equipped wheel. Both of these fine wheels are quickly demountable, and when demounted, bearings remain in perfect adjustment on axle. Solid front hub and double back seal mean big savings in grease and labor of greasing. Write us now for more complete details.



One of the largest producers of replacement wheels of all types. Send us your repair orders for production under our patented annealing process.

...a name to remember in 1943

★ Are you prepared to meet the production requirements of coal mining this year? Every indication points to demands never before shouldered by the coal mining industry.

Today, old, obsolete mine cars—obsolete in type, aged—are, in hundreds of mines, directly responsible for tremendous losses in tonnage—so called bottlenecks that not only retard production but prevent a superintendent from getting maximum results from available man power.

We know of mining officials who haven't the slightest conception of the amazing recent improvements that Sanford-Day has made in mine cars. Advertising pages simply cannot tell the story. You have to see S-D "Automatics" in operation—in the mine—to fully realize what a big advantage an S-D "Automatic" mine has over mines with other types of cars. Advantages in greater production with fewer cars; advantages in less man power, in less maintenance and in more profitable operation.

Shown on opposite page is our new S-D "NOCKOUT AUTOMATIC" car. The car with our new "Nockout" door releasing mechanism—the most valuable improvement yet made in mine cars since we developed the 1-2-3 door operating arrangement. Customary lever bar and all associated parts on outside of car have been eliminated entirely. Latch mechanism is completely protected . . . out of the way . . . out of trouble. Labor at dumping bin is useless because operation is all automatic, safe and foolproof.

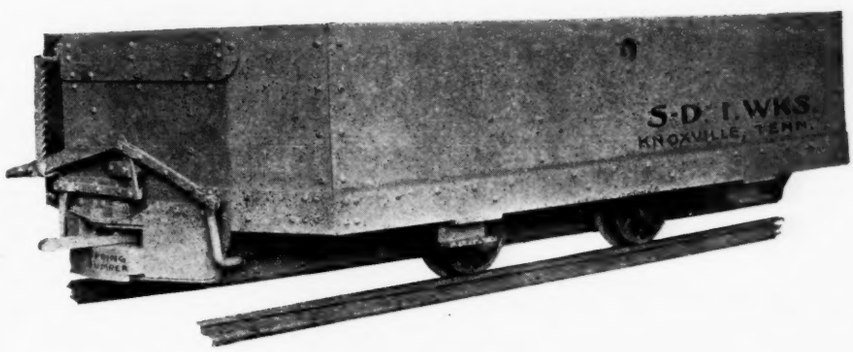
SANFORD-DAY is a name to remember this year, and don't forget it. Let it be a reminder that to increase production—to do it with fewer cars and with less man power, it will pay you handsomely to investigate S-D "Automatic" perfect operation.

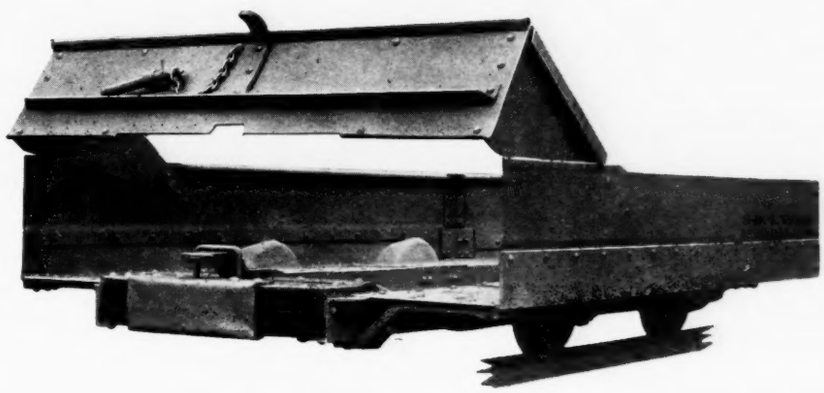
Remember, you can RENT "Automatics" on a basis so liberal that your savings will far exceed your rentals. No initial investment whatsoever.

S-D "WHOPPER" ROTARY AND END DUMP CARS

If conditions require that you continue the use of Rotary or End Dump Cars, Sanford-Day is the name you should remember in 1943! For over 40 years we have built and improved these types of cars until the coal mining industry has come to recognize them as the most satisfactory, most modern and sturdiest Rotary and End Dump cars to be had.

Special features in design in these cars provide the greatest capacity available for any given overall dimensions. They are rugged in their cantilever construction—built to take the punching . . . no binders to strip off . . . heavy structural steel side truss members easily support the heaviest load without sagging, as they are attached to the strong cross cantilever members at the ends of car body . . . no useless weight, and they are easily repaired in case of damage. If you are going to need cars this year, do something about it NOW. Remember the name—SANFORD-DAY.





Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

LOSING MANPOWER?

Aboveground!

ON CONVEYOR DRIVES—Many drives formerly requiring specially protected motors are now being well served by G-E Tri-Clad induction motors. Though classed as "open" motors, they have no openings in the upper portion. Cast-iron frame and end-shields fend off bumps and blows. Formex windings add to electrical protection.

FOR DUSTY LOCATIONS—Where dust and dirt might interfere with motor operation, G-E totally enclosed, fan-cooled induction motors offer a practical solution to conveyor-drive problems above-ground. Liberally designed metal-to-metal, dust-tight joints, plus close-clearance bearing lips and seals, keep grit away from windings and bearings.

MAIN MINE HOIST—To this all-important equipment, G-E motors, such as the wound-rotor induction motor shown above, and G-E control give flexible speed characteristics, plus unquestioned dependability. Hundreds in service throughout the mining industry have established long-term records for low operating costs.

Underground!

ON MACHINES AT THE FACE—This coal-loading machine, driven by a G-E permissible d-c motor, helps make the most of every man-hour. "Outs" for motor servicing are few, and overloads are handled without a seriously slowing down of the drive. This unit is powered with a compact motor—tested and passed by the Bureau of Mines.

On the basis of the service record of G-E permissible motors on mine locomotives, many mines now prefer G-E motors for their underground machines. A full range of types and sizes meets the needs of all standard machines.

FOR UNDERGROUND CONVEYING—Here is another G-E totally enclosed d-c motor, Bureau of Mines tested, and widely applicable to such uses as this conveyor drive. These Class BM motors have extra-heavy magnet frames and ribbed end shields. They are furnished with suitable stuffing box and ten feet of mine-type cable and air hose.

268 capable and well equipped motor specialists stand ready to give prompt and efficient service on Louis Allis motors should the need arise.

They are located in about as many strategic spots throughout the entire United States.

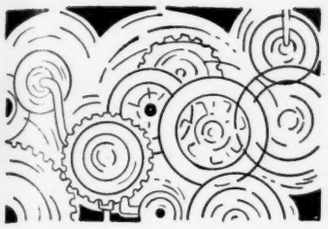
A generation of constant effort has been spent organizing this army of motor-service "minute men."

Time and time again they have proved their merit by giving almost unbelievably quick emergency service—even in some of the most isolated spots in the country.

To machinery manufacturers especially—whose products are shipped to all parts of the country this type of service is invaluable.

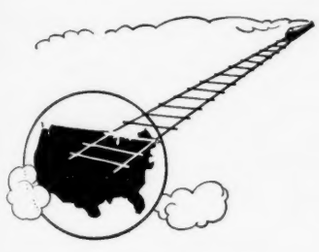
THE LOUIS ALLIS CO., MILWAUKEE, WIS.

BUY WAR BONDS — BUY THEM REGULARLY.



More Mechanization, More Power. Few mines ever planned for the power supply which increased mechanization is requiring. Fortunately, use of alkaline batteries gives a mine power latitude. They can be charged in 6 to 7 hours. They can be charging directly from the d-c power line.

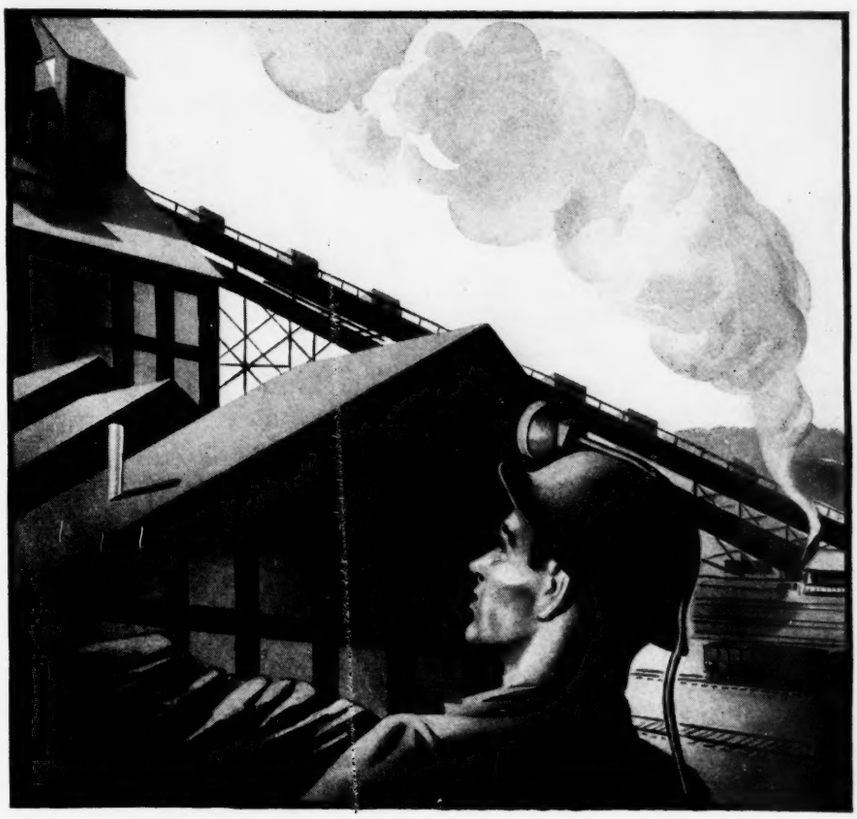
Said a Mine Owner: "Price is NO consideration to us in buying. Our need is efficiency and low maintenance cost. When the maintenance cost suddenly rises on a piece of equipment, we find that it soon has to be laid up for repairs — usually expensive repairs." His statement is a reaffirmation of the truth. While the initial purchase price of Edison Batteries is greater, their *use* cost is much less because they don't require repairs, need the least maintenance, last longest.



200,000 Miles of Track. That's a reliable estimate of the existing track in coal mines alone. Metal mines would increase the figure by another 50%. Where there's track there's travel—anything else is congestion. Alkaline batteries keep-a-going—don't stop on the job. Which means that their dependability is not only of great value in getting your money's worth out of batteries—but out of production, too.

Edison Storage Battery Division
Thomas A. Edison, Inc.
WEST ORANGE, N. J.

PEAK POWER needed for war



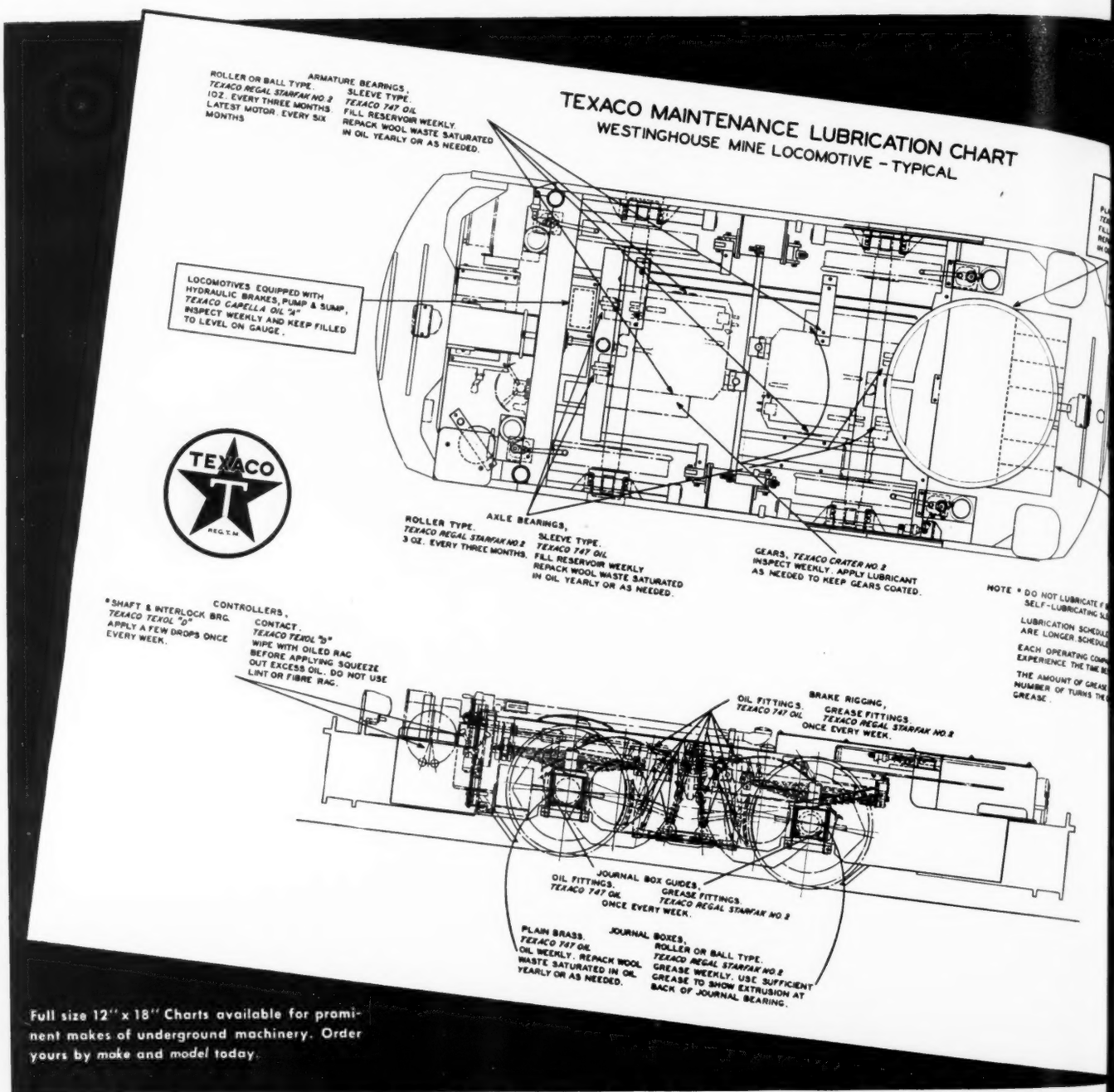
All storage batteries are *rated* for work. But it's the work they deliver that counts. To keep the production coming out, the flow of haulage and tramming must be almost perfect underground. This is most nearly reached where haulage units are powered by alkaline batteries. Their ruggedness, predictability and foolproof qualities are well known even where they are not used!

Few mines ever thought their batteries would see such hard service when they purchased them. But mines which purchased alkaline batteries are finding that they can take on the extra work without a ripple. They're almost never up for repairs. They don't fail unexpectedly on the job. They're easy to charge and maintain. And, their advantages are exclusive. The Edison is the only alkaline battery made in the United States.

MINING NEEDS THE DEPENDABILITY OF

Edison Alkaline BATTERIES

GREATER TONNAGE from



Full size 12" x 18" Charts available for prominent makes of underground machinery. Order yours by make and model today.

TEXACO
REG. T. M.

TEXACO

Cutters, Loaders, Locomotives

this simple way!

SWINGING into the new year under the greatest production drive in its history, the coal mining industry can continue to produce at a record-breaking pace only by keeping its mechanized equipment operating efficiently. This means that lubricants must be carefully selected and properly applied at regular intervals.

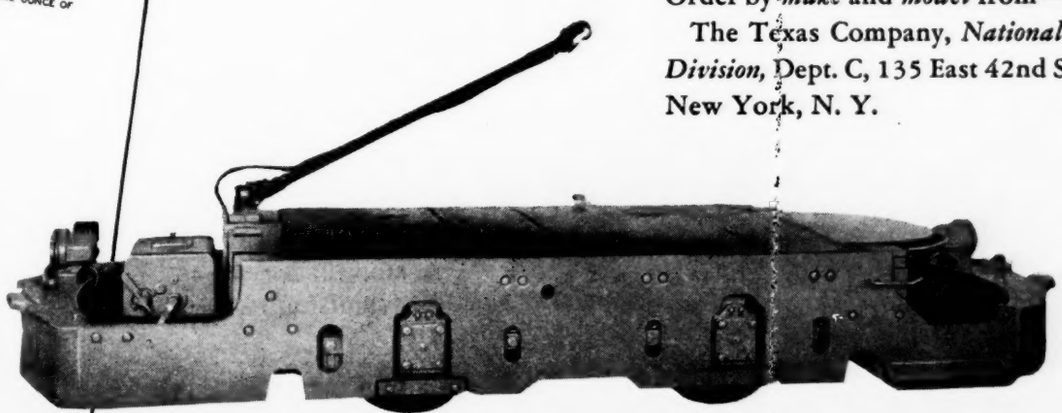
To help you lubricate effectively under wartime conditions, we offer, as a wartime contribution to the coal mining industry—Texaco Maintenance Lubrication Charts.

Developed in cooperation between Texaco and the engineering staffs of prominent equipment makers, Texaco Lubrication Charts (12″ x 18″ in size) show at a glance exactly *where, when* and with *what* lubricant to service each and every lubrication point of your cutters, loaders, locomotives . . . with lubricants approved by the manufacturer.

Texaco Charts at all lubricating stations for your men to follow will assure maximum service life . . . less time out for repairs.

Order by *make* and *model* from—

The Texas Company, *National Sales Division,* Dept. C, 135 East 42nd Street, New York, N. Y.



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ROEBLING "Blue Center" won't let them down!

It's a fast-flowing stream. A pontoon bridge won't do... So watch the Engineers swing one of their mobile cableways into action. A soldier swims across and a boat follows the line that was lashed to his body. Then comes the Roebling guy lines, bridge cable and anchorage tackle. In no time at all, the motorized winches are hauling jeeps and trucks across the 700 foot span.

It's another of those wartime miracles where the Corps of Engineers wrote the ticket and Roebling supplied the wire-making experience and the wire rope.

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JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
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WIRE ROPE IS INDISPENSABLE TO WAR

You can do your part to speed output and conserve steel for all America by getting the most out of the wire ropes you have. Faulty sheaves, for example, may be killing your ropes... preventing them from delivering the full service life that has been built into them. Here are a few things to look for:

1 See that no sheaves are out of alignment.

2 Check with a gauge for deeply worn or cut grooves.

3 Watch out for broken rims.

4 Check for worn or damaged journals that cause sheaves to stick or wobble.

5 Check for bent shafts that cause whipping or vibrations.

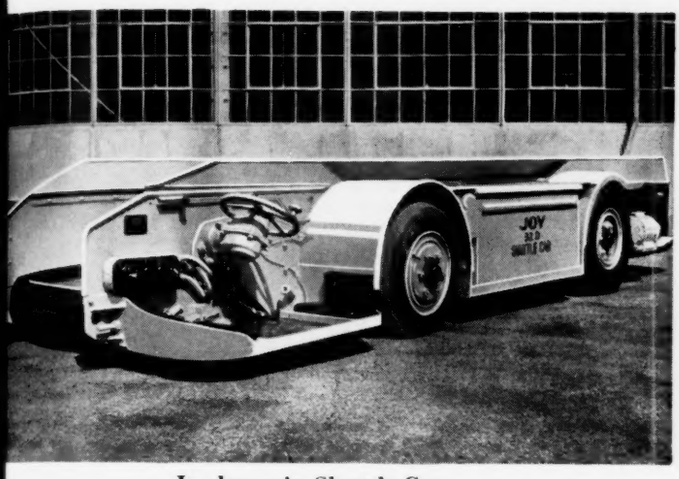
To help you inspect wire rope sheaves systematically and easily, we have prepared the helpful pamphlet shown left. Our nearest office will furnish as many copies as you need.

EXTRA

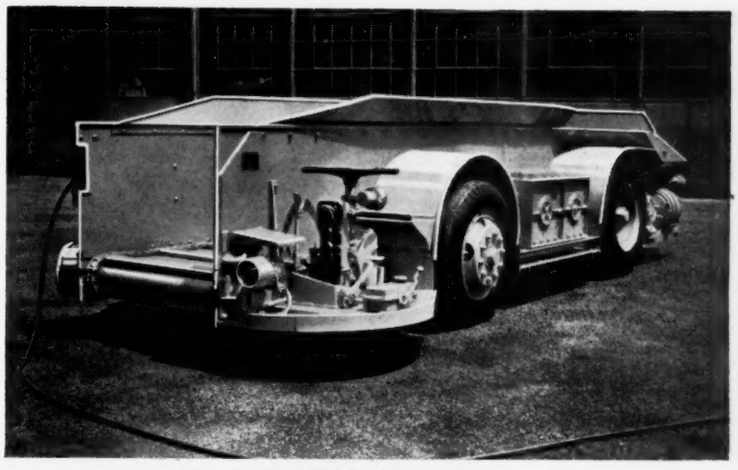
JOY LOADERS AND SHUTTLE CARS CAN AND DO INCREASE PRODUCTION AND LOWER COSTS

★★★ TO PRODUCE

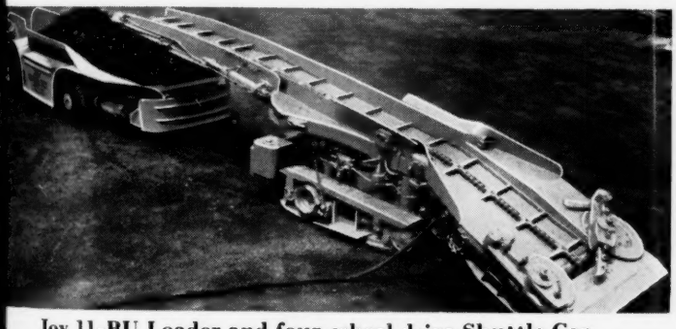
HELP



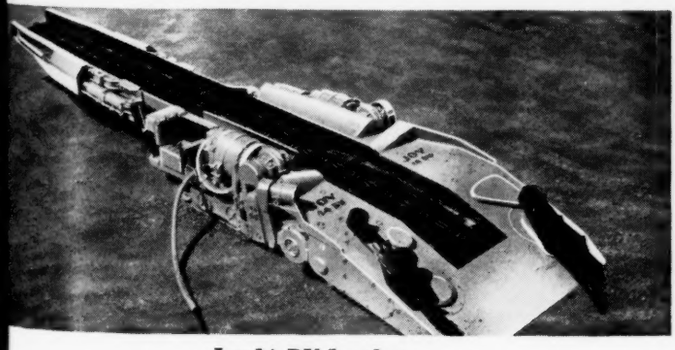
Joy low vein Shuttle Car



Joy Cable Reel Car



Joy 11-BU Loader and four-wheel drive Shuttle Car



Joy 14-BU Loader

"This Joy Equipment is certainly moving up Production Figures"

MORE COAL

JOY
MANUFACTURING CO.
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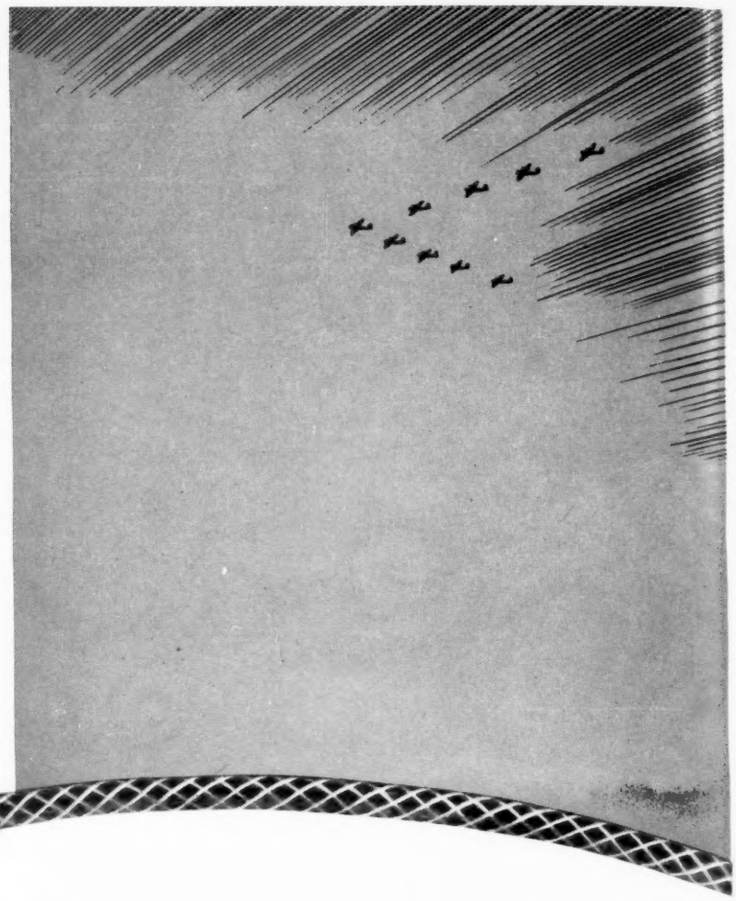


Against the sky . . . a tiny V winging toward the rising sun.

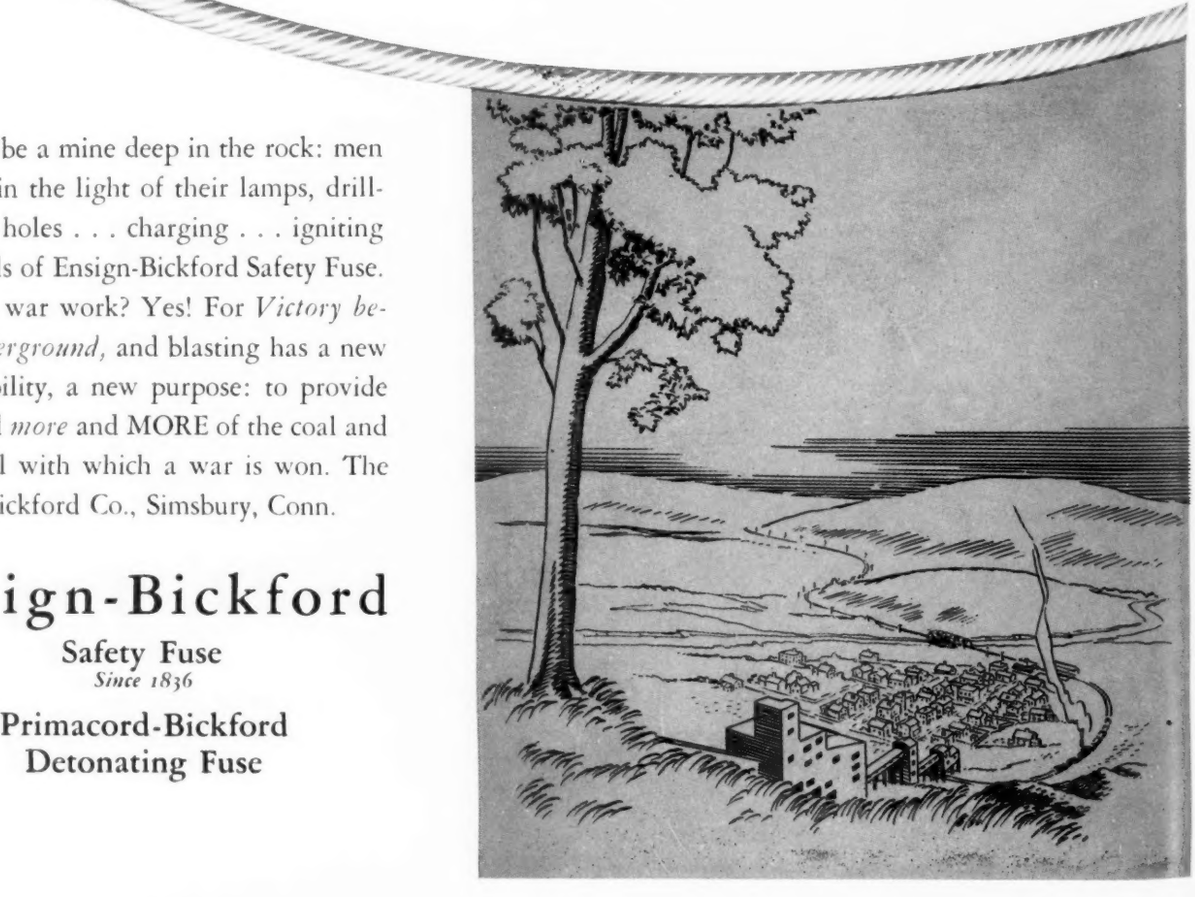
Far below . . . a small group of buildings, nestling in the Valley.

And deeper yet, in Earth's massive rock . . . a mine.

Partners in Victory. For the battle five miles up can be won in the mine one mile down, where coal or iron or copper or lead or silver . . . are blasted out of the earth.

It may be an open pit, where the pattern of smoke from a hundred holes tells the story of Primacord—the detonating fuse that is saving powder and man power—and promoting safety—wherever large blasting is done.

Five miles up and one mile down



It may be a mine deep in the rock: men working in the light of their lamps, drilling blast holes . . . charging . . . igniting the rounds of Ensign-Bickford Safety Fuse.

Is this war work? Yes! For *Victory begins underground,* and blasting has a new responsibility, a new purpose: to provide more and *more* and MORE of the coal and the metal with which a war is won. The Ensign-Bickford Co., Simsbury, Conn.

Ensign-Bickford

Safety Fuse
Since 1836

Primacord-Bickford
Detonating Fuse

Power—Giant Arm of Production

Ninety Per Cent of American Industry Is Electrified

ELECTRICITY is the mainspring that turns the wheels of our factories, mills and mines. It is the tireless arm that grinds our grain, weaves our cloth, pumps our water, builds our planes, our guns, our ships, our cars, our trucks and tanks . . .

The mighty Pharaohs had less energy at their disposal in building their pyramids than is generated today by one single power plant. The combined capacity of America's central power systems is without parallel in the history of the world . . . 46 million kilowatts, i.e., 65 million horsepower in steam turbines, hydro turbines and other prime movers. That is more power, day in and day out, than 650 million slaves could produce—for a limited time—minutes in fact.

The capacity of this vast fountain of energy is beyond the grasp of the average man who flips a switch and sets in motion machines that perform the labor of a thousand man-hours in a matter of minutes. Perhaps only the old time farmer, whose traditional source of power is a team of tired horses and a pair of calloused hands, knows how to appreciate this commodity that is so vital an ingredient of everything we consume and use.

Yes, we take electricity for granted. We expect it to appear in unlimited quantities, like water and air, as we need it. Almost as essential as these two elements in times of peace, it becomes a matter of life and death in times of war. Industry would collapse without it and the nation would quickly perish.

With the catastrophe of Pearl Harbor a little over a year ago, came the realization that we had to out-produce our enemies. To out-produce our enemies, who had a seven year head start, meant to turn more wheels than they were turning and to turn them faster than they were turning them.

New plants sprung up overnight. Production increased beyond our wildest dreams. Aircraft and shipbuilding surpassed the most daring forecasts. The machine tool industry's output grew to a volume that bordered on the miraculous. Guns, shells, uniforms, shoes, tanks and a thousand other items were being made in hitherto undreamed of quantities. All of them have one common essential ingredient – power. Industry demanded power – more and more power!

It is no small tribute to the power industry that, while other raw materials developed shortages necessitating strict priorities control, electricity remains unrationed – no priorities, no curtailments, no rate increase. Current industrial consumption is running 16 per cent over 1941 and 50 per cent over 1940. Not spectacular perhaps but when we consider that the nation's 26 million domestic consumers utilize only about 14 per cent of the energy output, we begin to get some idea of industry's power consumption.

Our power companies might have been stunned by the prospect of mounting demands for kilowatts. Instead they set about developing and coordinating a multiplicity of relatively small and seemingly unrelated factors. Individually or even collectively, these have not been of a spectacular nature. Certainly they have not inspired the award of the Army-Navy E although they are an essential ingredient in every Army-Navy E that has been awarded to American industry.

The contribution of the power industry to the winning of the war is not likely to flame forth in newspaper headlines. It takes the more prosaic turn of portraying an industry that is doing wonders quietly, unobtrusively.

At the close of the last war the power at the disposal of the American industrial worker averaged 3⅓ horsepower. At the beginning of this war, twenty years later,

This is the seventh of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers, and in daily newspapers in New York, Chicago and Washington, D. C. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

it had increased to 6½ horsepower. What other nation can even approach that figure? This large provision of power is the achievement of the electric utility industry. For years it had built and applied its equipment to the highest standards of performance and operated its systems to equally high standards of service and dependability. Always recognizing that "public service is a public trust" it had maintained wide margins of security in performance. Today these margins are the source of the power industry's ability to rise to the emergency.

In short, the electric utilities were prepared!

Power men are accustomed to looking ahead, to prepare for growing loads and allow for unforeseen contingencies, for electricity cannot be stored. It is "ordered" by touching a switch. It is delivered and consumed at the same moment.

Months before the actual outbreak of hostilities foresighted power men set to work computing how much life of equipment could be risked in the process of crowding it toward greater output. Generators, boilers, turbines, cables, transformers and even conductors underwent close scrutiny in an effort to increase the load – *safely*. They figured, they experimented, they tried untried measures.

Insulation, for example, is the crux – the least known component of electrical apparatus. When it lets go the service suffers. It is not easy to know how near any bit of crucial insulation is to letting go. It takes courage to work it to a point just short of failure . . . but that is exactly what is being done today.

Technological forcing of equipment, however, is not all of the story. Obsolescent equipment has been rehabilitated; salvage has been intensified; critical metals have been replaced by non-critical materials; water sprays, air-blowers and other cooling methods have been installed to keep over-loaded apparatus from over-heating. Nothing has been overlooked. Ingenuity has contrived the well nigh impossible.

Hand in hand with these measures of expediency have gone measures of intensification. Hydrogen pressure for cooling generators has been stepped up from ounces to pounds taking more heat away from the machines and enabling them to carry greater loads. Capacitors -- little more than aluminum foil interleaved with thin paper – have been applied by the carload relieving the systems of that mysterious reactive current which is associated with that equally mysterious power factor. They have performed wonders in avoiding the need for additional generating and transforming equipment. The use of portable sub-stations has averted the otherwise necessary reserve capacity in fixed installations at many points.

When coal was placed on the urgent list last spring the electric utilities outstripped all other industries in providing storage for the winter. Stocks on hand the first of October were sufficient for 105 days, or more than twice what would be considered adequate in times of peace.

When staff losses to the armed forces became serious power companies contrived measures that enable them to get along without aggravating the national manpower situation by hiring others to replace them. Today meters are being read every two or three months instead of monthly; women are being trained to do drafting, keep the logs in power plants and sub-stations and to test meters in shops and laboratories.

On the summit of "Grandpa's Knob", a mountain overlooking Rutland, Vermont, stands a giant windmill that would have been the delight of Don Quixote. Towering 200 feet above the tree tops its mighty 175 foot propeller turns with the wind and drives a 1,000 kilowatt generator which feeds its output into the Central Vermont Public Service Corporation's power system. The most ambitious wind-turbine generator in the world, and a daring experiment of forward-looking men.

Today everything electrical is being tried; is being worked harder than it has ever been worked before.

Great credit is due the men behind the electric power industry. These men have recognized the responsibility of their jobs – it is a part of their very being. Theirs is the kind of service that *must* be maintained. No soldier is truer to his trust than is the employee of this great industry.

The service must go on! No matter what happens – acts of God or deeds of men – the service must go on! Labor disturbances may disrupt other industries but there have been no shutdowns due to labor trouble in electric power plants since Pearl Harbor.

And this winter when blizzards pile up drifts and sleet makes pavements slippery there may be absenteeism from other plants but the utility employees will be on the job ready to climb the ice-covered poles and repair the ice-laden lines whenever the call comes.

In this war the least costly yet the most precious element of production – electricity – will be ever ready to "man" the machines that will produce the weapons that will give victory to the forces of freedom.

President, McGraw-Hill Publishing Company, Inc.

COAL AGE

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

JANUARY 1943

LOOKING AHEAD

HOW does the coal situation look after a little more than a year of war? Aside from getting out the vitally needed tonnage, now forecast at 600,000,000 for bituminous and 65,000,000 for anthracite in 1943, coal will be called upon to cope with a number of serious problems in 1943 stemming primarily from materials, manpower and regulation.

Materials and equipment will be tighter. This statement is not, of course, new. Whether the Controlled Materials Plan will alleviate the effects of the shortages remains to be seen. However, that is the idea and expectation, and perhaps improved producing capacity, particularly in steel and other metals, may help also. At least, it is to be hoped that even if supplies get shorter the control system will be smoothed out so that those available can be distributed promptly, equitably and with a minimum of confusion. But it behooves operators to consider growing coal demand on the one hand and tightening supplies on the other and prepare as far as possible against being caught in the ensuing squeeze. Substitutes, better maintenance and more from equipment and materials now on hand would seem among the logical steps, along with continued hammering home of the industry's vital part in the war effort and its consequent need for fair participation in available supplies.

Manpower likewise will become more critical, although recent developments promise some improvement in the future outlook. The ban on inducting men over 38; provisions for the release of those over that age when they possess essential skills, which late reports indicate will be facilitated; development of new standards and methods for deciding what men in essential industries shall be inducted and how soon, based in part on the new "manning tables"; and a firmer governmental stand on pirating and migration of workers are all hopeful omens. However, the road ahead is no boulevard, and further losses may be expected, especially to the armed services. Coal must put more pressure behind its efforts to keep key men and to replace and train new men for those in other than key occupations who will be inducted in the coming year. Completion of steps looking to universal adoption of the longer work week now is No. 1 on the manpower list.

Unless reenacted, the Bituminous Coal Act of 1937, extended two years in 1941, will expire April 26, 1943. Despite its imperfections it seems that in general it has benefited the industry. Perhaps it is not so essential now, but if it was needed before the war it probably will be equally needed after. It seems evident that the act will be extended with modifications. If that premise is accepted, it becomes pertinent to ask what the modifications should be. This the industry must decide now. Then it must see that its ideas are gotten over to Congress. Only thus can any needed reforms be achieved.

Zoning of shipments on through to straight rationing of coal are among other problems facing the industry, although as yet such steps are only possibilities. As long as coal mines can produce at the necessary rate and transportation is available, such steps remain only possibilities. In fact, as the Solid Fuels Advisory Council for War has brought out, adoption of zoning or rationing would be a disservice—at least at present. Barring major and yet unforeseen changes in conditions, such action probably never will be necessary, even in a mild form. But coal must be prepared to back up its case when advocates of such restrictions renew pressure for their adoption.

DELIVERING—WITH COAL

"THE WRAITH of 'The Great Transportation Shortage' has just about been laid." Thus *Business Week*, looking over the new Department of Commerce transportation indexes, sums up the present railroad situation. The total commodity transport index number was 103 in August, 1939; 152 in December, 1941; and 184 in August, 1942. The corresponding numbers for railroad transportation were: August, 1939, 101; December, 1941, 155; August, 1942, 209. Since Pearl Harbor, the railroad ton-mile traffic has increased 35 percent to produce a 20 percent gain in the total. This increase "has been achieved primarily through increased efficiency; very little by installation of new equipment."

The carriers are not out of the woods, "but with the peak of the war effort increasingly in sight, transportation no longer threatens to become a fundamental limiting factor upon that effort."

The coal-burning locomotive can take the lion's share of the credit for the accomplishment of this herculean job. The railroads are using more than 10,000,000 tons of coal a month in moving freight and passengers, with war materials and troops in the majority. As might be gathered from this, the coal burner is delivering the goods. The trend toward diesel and oil-burning locomotives has definitely reversed, says the National Coal Association, pointing out that on Oct. 1, 1942, the total of 24,807 freight locomotives on Class I railroads included only 51 diesel and 353 electric units. "Some few of the steam locomotives use oil, but that number is diminishing. Over 97 percent of the tractive effort is in the steam locomotives." In passenger service, out of the 6,932 locomotives in use, only 458 were electric and diesel machines. "Including all the oil-burning engines in the West, the use of fuel oil in locomotives amounts to only about one-sixth of the total fuel consumed by American railroads."

Steam locomotives lead the list in government-approved construction schedules, which, for example, call for 250 steam units in the first eight months of 1943, compared with 36 road diesels in the same period. Production of switching diesels during the first six months of 1943 is scheduled at 100 units. All this lends force to two N.C.A. statements: (1) "The coal-burning locomotive of today is just as much an improvement over 1920's model as the present airplane over those in use during the last war"; (2) "Now is the time to do some intensive study of the relative merits of the modern coal-burning locomotive vs. other types, and the industry's research departments, in cooperation with certain railroads and builders of locomotives, have plans under way to develop to the utmost the coal-burning locomotive." To which might be added: a project well worth supporting.

MAKE IT LAST

SCRAP is badly needed, but not at the cost of careless destruction of a usable item of equipment or supplies. The fact that things are scarce and getting scarcer, making conservation more vital than ever before, has been dinned into everybody's ears for months. It seems, however, that it hasn't yet fully registered in some respects. As a case in point, one oil company reports that out of a return shipment of some 200 containers, 170 had been rendered unfit for further use by such things as opening them with a pick.

Oil drums are scarce, and every one rendered useless is just that much more of a burden on the war effort. It should be remembered that the loss of any item of equipment or supplies through carelessness hurts two ways. One is the loss itself and the other is that the mine then has to do without or else the war effort is burdened by subtracting material to make a replacement that otherwise would not have been necessary. Care in making equipment and materials last will pay handsomely as the war goes along, and will help bring it to a victorious conclusion at the earliest possible date.

BACK LOG

WHAT the people of the United States intend to acquire when the war is over was the subject of a recent investigation by the Chamber of Commerce of the United States, based on several thousand family interviews. This investigation indicates that within six months after victory some 900,000 families intend to build or buy new homes. Also, some 34 percent of all home owners plan repairs and improvements, such repairs and improvements presumably including heating equipment. Who will get the heating business for these new and improved homes and, incidentally, the cooling business, as it seems quite likely that the new home will include cooling equipment as a matter of course? Coal has the equipment and the fuel, and is improving both as time goes by. If it has the story, it should cash in handsomely.

OIL TREND

INCREASING concern over future prospects has marked oil developments in recent months. Talk of shortages in earlier days usually provoked nothing but mirth, since prophets were confounded by such things as the discovery of the East Texas field and the development of geophysical prospecting and deeper drilling. None of these revolutionary changes, however, can be expected to be duplicated in the future.

According to *The Oil Weekly*, 1,816,000,000 bbl. of oil was discovered in the United States in 1938, but in 1941 discoveries dropped 78 per cent to 400,000,000 bbl., enough for only 100 days of consumption at present rates. In 1938, 2,638 exploratory wells—that is, wells outside the margins of recognized oil deposits—were drilled. In 1941, the number rose to 3,113, an increase of 18 percent, so the decline of 78 percent in new discoveries was not due to a reduction in exploratory activity nor again to a failure to choose suitable locations for such exploration, because 65 percent more wells in exploratory locations were successful in 1941 than in 1938.

In these figures the coal industry has plenty of opportunity for optimism, but, because of past experience with the uncertainty of oil prognostications, coal operators will continue to keep their fingers crossed. But this time, perhaps, the oil industry will fail to respond to the deathbed ministrations of geology and geophysics and will fail to find an Eldorado like East Texas, so "the brink of an oil shortage" may have been reached.

COAL AGE NEWS ROUNDUP

Longer Work Week Hangs Fire in December; WMC Plugs Its New "Manning Tables"

Appalachian Operators and Miners Split on Overtime and Discipline in Longer Work Week — Meetings Temporarily Cease — Anthracite Agreement Drawn up Pending Granting of Price Increases—War Manpower Commission Reorganizes and Publicizes Manning Tables

WITH OPA reported as willing to grant increases in maximum prices to take care of the necessary extra costs of overtime and more costly materials, bituminous miners and operators still had failed to find a common meeting ground up to the last week of December for extending the work week. Meantime, it was reported that the anthracite group had an agreement ready to put into operation as soon as the necessary changes in maximums were promulgated.

Material changes in the Selective Service and War Manpower Commission set-ups to facilitate better utilization of industrial and farm labor and smooth out the problems involved in drafting activities were developments on the general labor front in December. WMC actively continued plugging its new "manning table" plan, developed to solve many of the problems arising out of Selective Service activities.

Departures to other industries and military enlistments were reported to be the major factors in an increasingly critical coal situation in Canada in December. On top of this, a number of operators were reported to be greatly worried over the timber and machinery situations. Strikes in a few regions also complicated the picture. In the Nanaimo and Cumberland fields of British Columbia, however, one stoppage was ended by War Labor Board action granting a 10 to 12 percent wage increase. Relaxation of restrictions to permit employing farmers and other semi-skilled men were among the steps being taken to alleviate the shortage, along with active consideration of a proposal that miners in the army be granted leave of absence to return to work.

Shortages also were forecast in certain southwestern states and in the Rocky Mountain and Pacific Coast regions of the United States this winter due to heavier industrial demand and lack of productive capacity further complicated by a shortage of manpower and the necessity of using many green men. As reported in the December *Coal Age*, working a seventh day in the Rocky Mountains and on the Pacific Coast was authorized in November, but available data indicated that repair considerations, making it necessary to use at least one day a week to go over equipment, along with other difficulties, including, it was charged, failure of the union to cooperate in some areas, had prevented realization of the theoretical advantages. In Utah, Governor Maw, in a move to bypass some of these difficulties, proposed to John L. Lewis, president of the United Mine Workers, that an extra hour be worked part or all of the days of the week.

Disagree as to Overtime

Appalachian operators and the United Mine Workers failed to agree on contract revisions to permit working six days a week. Negotiations came to at least a temporary halt Dec. 12, when the two groups split over the points to be covered in the agreement. The major differences grew out of disagreements over defining when and how overtime should be paid, and over the miners' insistence that no man should be disciplined or penalized for failure to work on the sixth day. To accept the union's clause, the operators contended, "would mean that management would have no voice or control over the sixth-day operations at its property." Bituminous operators also contended that they should have at least as explicit terms as in the proposed anthracite agreement. Countering, K. C. Adams, editor of the *United Mine Workers' Journal*, stated that "the Appalachian operators insist on preferential treatment tantamount to amending the basic Appalachian wage agreement. They have offered a proposed wage contract amendment that would permit them to penalize mine workers unjustly and indiscriminately. They insist that the mine workers bear the burden of the failure of management to provide efficient management and working conditions for the sixth day, which might also cover inadequate railroad car supply."

These differences seemingly were the principal stumbling block in progress toward a longer work week, as OPA had announced that increases in maximum prices would be granted to cover extra overtime and materials aggregating 18 to 22c. in the various Appalachian fields, including about 8c. for higher materials cost. The War Labor Board, on Dec. 17, refused to intervene in the deadlock on the ground that the issue was one of collective bargaining. Its ruling was made at the request of one of the interested parties, as the case, as is customary, had not been certified by the Secretary of Labor.

Tentative agreement on revisions of the anthracite contract was announced Dec. 10, subject to the granting of higher maximums.

Pertinent sections from the three proposed agreements are reproduced as follows. The union bituminous proposal already has been accepted in the Far West and by a number of captive operations in the East (December *Coal Age*).

UNION BITUMINOUS PROPOSAL

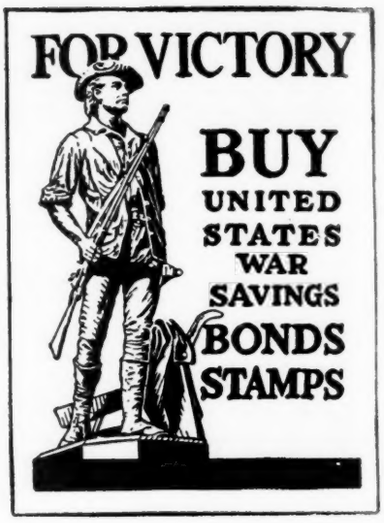
A. The basic work week of thirty-five hours per individual employed shall be agreed as beginning on Monday of each week.

B. The six-day work week is authorized, provided that all individual mine workers working in excess of thirty-five hours in any one week, beginning on Monday of each week, shall be paid time and one-half

(Turn to page 120)

Oil Picture Grows Darker in December; Coal Use Pressed by Government

Oil Supply Gets Tighter, Especially in the East—Further Steps Taken to Speed Deliveries—Conversion Work Intensified—OPA Issues New Rationing Regulation Encouraging Use of Coal Stoves



OIL continued as the sore thumb in the fuel picture in December, with the shortage in the East and to a lesser extent in other regions provoking more dire forebodings of discomfort and threats of compulsory conversion. Meantime, efforts to increase the supply included cutting the gasoline ration in the East from 4 to 3 gal. per coupon and additional attempts to speed up transportation both immediately and in the future. At the same time, further steps were taken to ease the task of securing equipment for using solid fuels, and to insure an ample supply of such fuels.

"Since experts and authorities are unanimous in their appraisal of the seriousness of the oil shortage, the present problem obviously is a definition of ways and means to alleviate this deficiency," declared Allen J. Johnson, Anthracite Industries, Inc., Primos, Pa., in a paper presented at the Dec. 1 meeting of the American Society of Mechanical Engineers, in New York. "The deadline has long since passed for long-range planning or even for very careful deliberation. It is therefore absolutely necessary to find a solution that can be made effective at once. This, in turn, points to the advisability of compelling the 25 percent, or 350,000 persons, who retained their grates to re-install them immediately.

"At earlier stages of planning it was argued that it would be unfair to thus penalize those who had been provident in retaining spare equipment. However, it must be remembered that in asking them to return to coal, we are at this time in reality merely assuring them comfort as well as releasing oil for their less fortunate neighbors.

"It also is fitting that such auxiliary means as can be immediately placed into effect should also be provided for those who cannot convert. The latter includes space heaters and both standard and universal grates, for which every facility should be provided to enable quantity production for immediate consumer relief. If these steps are followed without delay and with adequate publicity and enabling regulations, we may avoid serious widespread hardship this winter."

The 1942 production of anthracite, said Mr. Johnson, will exceed 59,000,000 tons, and should provide an excess of some 2,000,000 tons to be used by additional homes converting from coal to oil. This amount is sufficient to replace all oil in approximately 200,000 homes, with an annual saving of nearly 10,000,000 bbl. of oil. The supply of bituminous coal is reported to be equally secure, thus offering additional possibilities." Late reports, said Mr. Johnson, indicated that "only 40,000 homes out of 1,400,000 had converted" in the East. Terming the oil situation so critical that some New Englanders might freeze to death this winter, Ralph K. Davis, Deputy Oil Administrator, early in December revealed that additional work was being done on a plan to compel wholesale conversions. This plan contemplated prohibition of delivery of oil to persons having convertible equipment unless they were able to obtain special certificates of exemption from their ration boards. Other measures under consideration were a further cut in rations. To help solve the New England problem, Oscar F. Ostby was appointed assistant deputy coordinator of solid fuels for this region to assist in handling the solid fuels supply and in conversion work.

Pump Deliveries Slow

While deliveries of pipe for the eastward extension of the 24-in. Texas-Illinois pipeline went forward apace, operation of the original section was delayed by slowness in installation of pumping equipment. Meantime, tank-car shipments declined. In an effort to build them up, the War Production Board was asked to reassign cars now used in transporting other liquid products as far as possible. Reversal of the flow and other pipeline adjustments were adopted, and tank-car shipments of gasoline to the southeastern States were ordered discontinued to release equipment for the fuel-oil haul. Increased production of tank trucks for the Middle West also was ordered to eventually release more cars.

Plans for constructing more than 1,000 tugs, towboats and barges capable of moving more than 100,000 bbl. of oil daily to the East Coast in 1943 were announced Dec. 16. In addition, construction of three additional barge-loading terminals was planned with tentative locations at Cairo, Ill., and Jacksonville and Panama City, Fla.

Plenty of coal to replace oil was promised by Solid Fuels Coordinator Ickes and evidence indicated that this was the case in the East and Middle West. Reports from the Southwest, Rocky Mountains and the Far West, however, indicated that the supplies were short and in fact even critical in some regions. In the East, however, Mr. Ickes warned that despite the relatively good outlook consumers planning to convert should place coal orders at once.

To facilitate industrial and commercial conversion, granting of priority applications was streamlined by WPB. WPB also moved to make available 300,000 additional coal- and wood-burning stoves, and arrangements were reported to have been completed with the Army for the release of 100,000 additional stoves now or to be manufactured.

Canada apparently faced a growing coal shortage in December, one of the major reasons being loss of mining manpower, with a corresponding production slump in late months expected to carry over still more heavily in 1943. In British Columbia, as an example, the output was stated to be running 1,000 tons per day less than in 1941. To meet this "grave emergency in the field of coal production,"

appointment of a three-man Emergency Coal Production Board was announced by the Minister of Finance early in December. The board is empowered to direct mine operations as to policies, methods and working conditions; recommend transfer of mine labor; obtain financial assistance for mining companies and require them to adopt a bonus plan or other production incentive; make investigations and require reports; close mines where production is inefficient; enter premises and take possession of supplies of coal at prescribed prices; take possession of premises; and perform all other "such acts and things as are ancillary or incidental to the exercise or discharge of any of the foregoing powers or duties." Another Canadian step was ordering of the payment of subventions up to $2.50 per ton to railways to promote westward movement of coal brought by water from Cape Breton mines to Pointe du Chene, N. B.

Further Materials Limitations Imposed; Knoizen Takes Mine Equipment Job

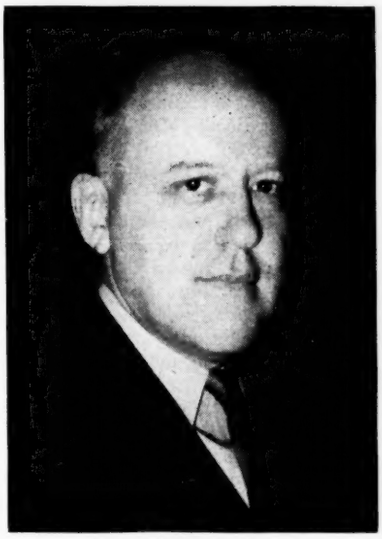
RELATIVE quiet marked the priority situation in December, in which month the military services and WPB progressed further toward a settlement of their respective spheres of influence and WPB plugged its new Controlled Materials Plan (see December *Coal Age*) at meetings over the country—primarily for manufacturers. "For most products," WPB announced, the bills of materials provided for by CMP "will not be required from every producer. No company need prepare a bill of material unless specifically instructed to do so by a claimant agency, a WPB industry division or by another company to which it sells its product and which has been instructed to furnish a bill of material." Repair parts quota forms for mines holding serial numbers under P-56 were issued early in December, Form PD-400-B applying to coal mines.

Arthur S. Knoizen, vice president, Joy Mfg. Co., Franklin, Pa., was granted leave of absence to become director of the WPB Mining Equipment Division, formerly the Mining Division and before that the Mining Branch. No changes in the functions of the division have been made. Mr. Knoizen succeeds Dr. Wilbur A. Nelson, assigned to staff duties in the office of the director general for operations with the title of assistant director for staff, War Production Board.

Materials and equipment to which further limitations were applied by WPB late in November and December included: laboratory equipment, no item costing over $50 without prior WPB approval (second-hand items not covered in this amendment to L-144); institution of allocation control over domestic mica Dec. 10; calcium carbide, delivery or acceptance without prior authorization from WPB prohibited after Jan. 1, 1943.

Each purchaser of electric motors must show that the horsepower of the motor he is applying for is no greater than that required to do the job, according to a provision in General Conservation Order L-22 announced Dec. 4. L-221 prohibits the delivery or acceptance of motors unless they comply with certain standard specifications and are of the simplest practicable mechanical and electrical design. It also requires the purchaser to certify and show reason why he must have a motor of a special type and restricts the use of special types, such as explosion-proof, to the conditions and purposes for which they are required.

One of the important conservation provisions in the order applies to both motors and generators. It requires the applicant to certify that he has made every reasonable effort to adapt idle equipment in his possession, to obtain used equipment or to repair or recondition existing equipment. The order went into effect Dec. 10.



A. S. Knoizen,
New Mining Equipment Division head.

The coverage of the maximum-price regulation on Central Appalachian wooden mine materials and industrial blocking (MPR 218) was extended to take in all of Ohio, West Virginia, Virginia, Maryland, Pennsylvania and New York. Pit posts are kept on a delivered price basis, while other wooden mine materials were changed to f.o.b. nearest railroad loading point. Wedges and caps were changed to a per-1,000-ft. basis rather than a piece basis.

Maximum prices on mine timber, industrial blocking and railroad ties produced in 15 western states also were set by OPA in a new order (MPR 284) announced Dec. 15. The states covered are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North and South Dakota, Utah, Wyoming and parts of Oregon, Washington, Texas and Oklahoma.

Limitations on the distribution of welding rods and electrodes under Order L-146 were abandoned in December through revocation of the order. If purchasers find preference ratings necessary, applications for orders of less than $50 should be addressed to local WPB offices; over $50, to WPB in Washington.

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Coal-Burning Ships Studied

Possible use of coal in ships being constructed by the Maritime Commission and the use of coal by other government departments and agencies was the subject of a hearing Dec. 9 by the Senate Truman committee. A spokesman for the Quartermaster General's department stated that all branches of the Army have been instructed to use coal instead of oil where practicable. Out of 223 installations made since WPB requested coal use, only 28 have been made for gas and 4 for fuel oil.

Inability to get crews, loss of cargo space and possible difficulty of getting coal in foreign ports were among the reasons for sticking to oil in shipping, stated Admiral Land, chairman of the Maritime Commission. Additional hearings were scheduled by the committee, at which it was expected that evidence of the practicability of coal use on shipboard would be brought out by factual data.

Battelle Receives B.C.R. Commission To Study War Fuel Problems

BITUMINOUS COAL RESEARCH, INC., research agency of the National Coal Association and the bituminous coal industry, has completed contract arrangements with Battelle Memorial Institute, Columbus, Ohio, for the largest coal research program ever undertaken by the coal industry, according to Clyde E. Williams, Battelle director. The contract calls for emphasis on the power and fuel problems of war industries and for expansion and extensions of earlier research studies. There will be extended investigations in the application of coal to metallurgical processes and of means of conserving coal by more efficient utilization in industrial and domestic power and heating plants.

In addition to conducting the research program, Bituminous Coal Research and its technical committee of fuel engineers is serving as consultant to the government's Solid Fuel Coordinator, Petroleum Coordinator, and the Power Branch of the War Production Board. Its services are being utilized for advisory work relating to the conversion of steam plants from other fuels to coal as well as to assist in the selection of the available coal and proper burning equipment for new plants which will be built by the government or by industries under WPB permission.

Further development of the use of pulverized coal in forge furnaces is scheduled in the new research program. Such a development will effect great savings of oil and gas in war industries, as will the successful conclusion of investigation of the application of pulverized coal to radiant tube and other industrial furnaces.

Gasification of coal—its complete conversion into fuel gas by chemical and physical means—will be investigated by Battelle fuel technologists in an effort to arrive at a more economical gaseous fuel. Smokeless methods of coal combustion, in which the smoke that ordinarily goes up the flue of the factory or home is burned to colorless gases, also will be studied under the new program. Battelle fuel engineers have already developed a smokeless stove for the home, and will now seek to extend its principle to other heating equipment, thus salvaging great quantities of energy usually wasted as smoke.

Other research studies will include the necessary development of chemical dustproofing of coal to replace the present oil-treatment methods, development of power directly from coal by the use of pulverized coal as a fuel in an internal-combustion engine, and an investigation of possible new designs in coal-burning railroad locomotives.

The research program at Battelle is under the direct supervision of Ralph A. Sherman, fuels authority of the Institute's staff, who has available the services and facilities of one of the country's largest research organizations.

The program is financed jointly by coal producers' associations, leading coal-carrying railroads, and individual coal companies throughout the country. The present program is a continuation of previous research by Bituminous Coal Research, the major part of which was likewise conducted at Battelle. In the earlier program, research on the problem of selection and preparation of coal for residential underfeed stokers, on the dustproofing of coal with oil, on the relative economies of house heating with various fuels, on the segregation of coal in industrial power-plant bunkers, on the utilization of coal in pulverized form in steam plants, on the use of coal for the dehydration of hay, and on the possibilities of research in the gasification of coal developed information that has materially aided the bituminous coal and allied industries.

Moving spirit in Bituminous Coal Research and its program is Howard N. Eavenson, Pittsburgh mining and consulting engineer, and president of the research agency. C. A. Reed, engineering director, National Coal Association, is secretary, with offices in Washington, D. C., where M. L. Garvey, treasurer, and J. F. Hanley, assistant secretary-treasurer, also have their offices. Other officers include E. R. Kaiser, Columbus, Ohio, and A. W. Thorsen, Pittsburgh, Pa., assistants to the president, and R. H. Sherwood, Indianapolis, vice president.

The board of directors is composed of J. E. Butler, Stearns Coal & Lumber Co., Stearns, Ky.; E. H. Davis, New York Coal Co., Columbus, Ohio; Irvin Davis, Hatfield-Campbell Creek Coal Co., Cincinnati, Ohio; B. R. Gebhart, Chicago, Wilmington & Franklin Coal Co., Chicago; H. A. Glover, Island Creek Coal Sales Co., Huntington, W. Va.; W. C. Hull, Chesapeake & Ohio Railway Co., Cleveland, Ohio; Ralph E. Jamison, Jamison Coal & Coke Co., Greensburg, Pa.; C. J. Potter, Rochester & Pittsburgh Coal Co., Indiana, Pa.; S. S. Nicholls, White Oak Coal Co., New York City; D. H. Pape, Sheridan-Wyoming Coal Co., Monarch, Wyo.; K. A. Spencer, Pittsburg & Midway Coal Mining Co., Kansas City, Mo.; J. B. Morrow, Pittsburgh Coal Co., Pittsburgh, Pa.; and Messrs. Eavenson and Sherwood.

OPA Promotes Heating-Stove Installation

Encouragement rather than restriction of purchases is the objective of a new OPA rationing order (No. 9) designed to promote the installation of coal- and wood-heating stoves to replace oil. As a preliminary, the War Production Board lifted weight and quantity restrictions on coal heaters under Order L-23-c until Jan. 31, 1943, and increased manufacturers' iron and steel quotas 50 percent for February and March, 1943. In addition, several thousand magazine-type Army No. 1 heaters already manufactured were released for sale to civilians, along with additional materials stockpiles for such heaters plus several months of productive capacity in the plants working under Army heater contracts.

The emergency heating-stove rationing program and Ration Order No. 9 became effective at noon, Dec. 18. Under its provisions, retail sales of both coal-fired heating stoves and new oil-fired units, except to the military services and the Maritime Commission, were restricted to those consumers granted a certificate of purchase by their local rationing boards. Effective throughout the area in which fuel oil now is rationed, the order does not affect the sale of cooking appliances. The primary purpose is to foster the purchase of stoves by those now using oil heat and also those eligible for auxiliary oil rations who desire to use coal instead of oil. Sales of new oil-burning stoves are strictly limited.

A purchase certificate issued by the local board for any kind of a rationed stove is surrendered to the dealer at or before the time the stove is purchased or installed. Dealers, wholesalers and manufacturers in the oil-rationed areas may buy stoves or space heaters from dealers, wholesalers or manufacturers anywhere in the United States without the surrendering of certificates.

Home of Wayland "Wasp" coals. Rated at 600 tons per hour, the plant now is equipped for both wet and dry cleaning.

AIR-CLEANING FINES

Made Practicable by Dust Separators

Removal of Dust by Air Separator New to Coal Mining Makes Possible Air Cleaning of ¼x0 at Wayland—Capacitors Installed to Reduce Plant-Load Current—New Washer Will Reclaim Carbon Product

By J. H. EDWARDS
Associate Editor, Coal Age

TO ACCOMPLISH what has been considered impossible in air-treatment of fine coals, a machine new to the coal industry has been installed in the 600-ton-per-hour preparation plant of the Elk Horn Coal Corp., Wayland, Floyd County, Ky. In addition to the air cleaning plant, other recent improvements include a new crusher, new dewatering screen and a revision of refuse-disposal methods to eliminate a bottleneck. On order and soon to be installed for further refinements to the job were a fine-coal cleaner for reclaiming carbon from dust, sludge and fines from a new screening operation, and three banks of electrical capacitors to reduce the plant load-current, thus saving power, improving voltage regulation on the motors and avoiding the purchase of larger transformers.

The large five-track steel tipple (Fairmont) with crushing, screening and blending facilities was built in 1937 (Coal Age, November, 1937, p. 66) to displace two original tipples at Wayland and Garrett. At the time of planning that 1937 improvement, most of the loading was by hand, and to facilitate inspection a flygate was installed under the weigh basket of one section of the rotary dump to divert the coal from certain cars over a scraper conveyor and reciprocating feeder to an inspection table.

As mechanical loading was extended, the need for mechanical cleaning became urgent and as a first step, in 1938, a Jeffrey three-compartment Baum jig was installed to wash 5x¾-in. coal at a rate of 485 tons per hour. With a further increase in mechanical loading, the next urgent problem was cleaning the ¼x0-in., which, in the raw state, contains 16 to 17 percent ash, although the inherent ash of the coal, Elkhorn No. 1 seam, is under 3 percent. Preliminary experiments with this fine coal proved the problem to be a tough one. Air cleaners could not do a mentionable job on the fraction smaller than 14- to 20-mesh and dedusting screens could not eliminate a sufficiently high percentage of that size from the ¼x0-in.

The Roberts & Schaefer Co. finally offered a solution making use of Raymond mechanical air separators with patented revolving whizzers (Raymond Pulverizer Division, Combustion Engineering Co., Inc.). The complete air plant installed by R. & S. and put into service in May, 1942, includes two Stump double-unit boxes. From a bucket elevator with its discharge at the top of the new plant the ¼x0-in. raw coal splits to two surge bins each one directly above the feeder at the top center of an air separator. From the bottom of each separator the tailings (¼-in.x28-mesh) flows directly to the respective Stump box on the floor below. The minus-28-mesh drops through a chute to a drag-chain refuse conveyor.

The whizzers at Wayland, each handling approximately 50 tons per hour of raw feed, are 14 ft. in diameter and 22½ ft. from the top of the feed valve to the bottom of the cone. The air circuit involved in making the separation is entirely contained in the machine and there is no air escape and consequently no dust problem. The moving parts (operating at approximately 675 r.p.m.) are all near the top of the 14-ft. casing and are mounted on a hollow shaft with one long bearing at the top. Attached to this vertical shaft are a number of arms carrying fan blades. Below that is a disk with whizzer spokes sticking out from the edge and at the bottom a circular flat plate which receives the material from the bottom of the hollow shaft and, by centrifugal force, projects it horizontally into an upward stream of air.

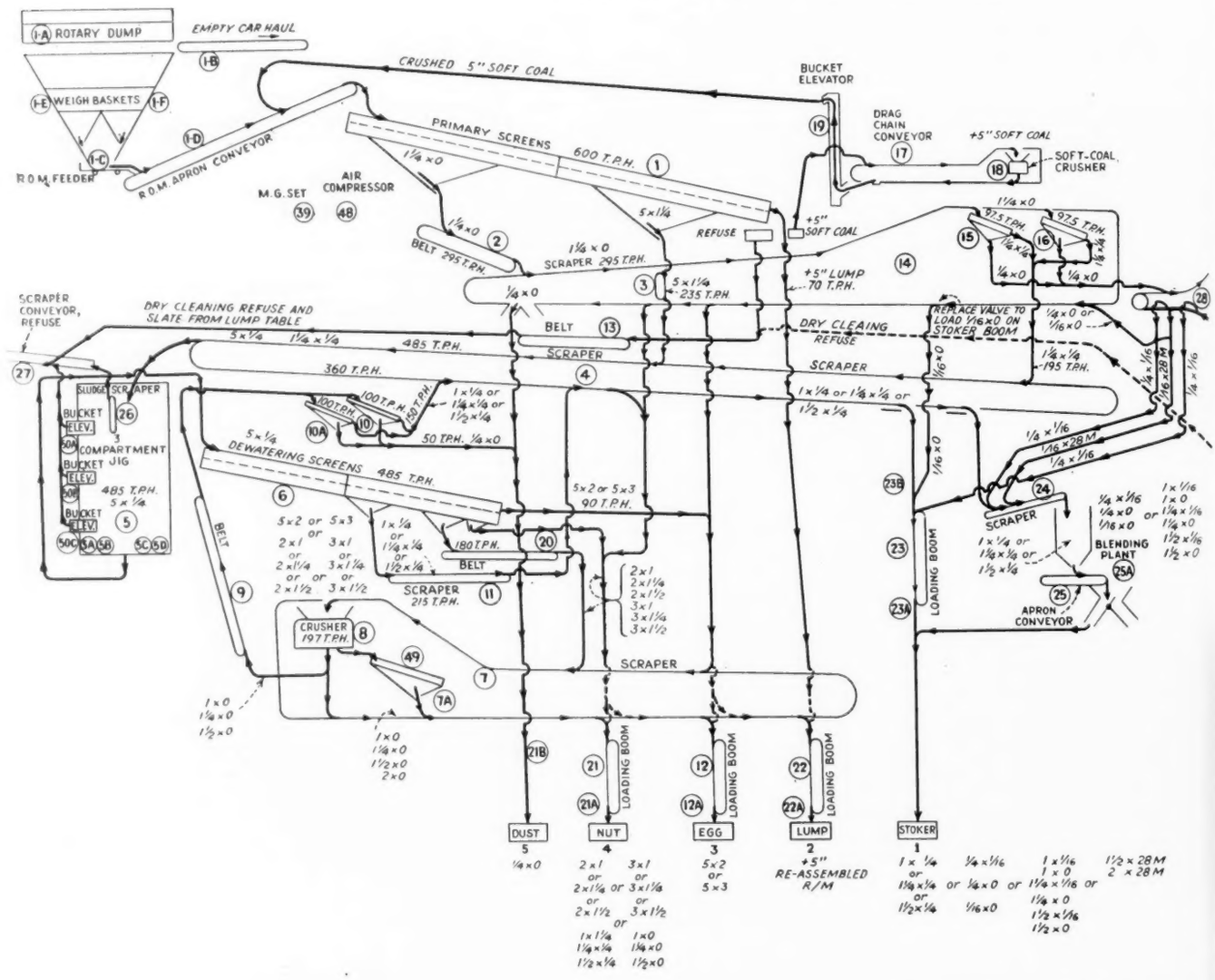
The radial blades of the whizzer tend to break up the flow and help throw the coarse particles out of the air current. As the dust-laden air coming through the fan moves downward in a spiral path through an outer cone it strikes stationary deflector vanes as it enters the inner cone and thus drops much of the dust. The drive for each whizzer is a 60-hp. motor. It is reported that the machines at Wayland are removing better than 96 percent of the minus-28-mesh dust. Indications point to a very low maintenance cost.

Wet coal, the bugbear in dry treatment, has caused no difficulty at Wayland. Only occasionally are wet working places encountered in the mine. The operations are drifts and at times part of the output gets rained on during a haul of one mile on the outside. Practically all of the time the raw feed to the plant is sprayed with "Sealtite" and water at the feeder to the mine-run conveyor under the rotary dump. This greatly minimizes the dust nuisance in primary screening. As a rule, the cleaned ¼-in.x28-mesh from the Stump boxes is so damp that it will ball up in the hand.

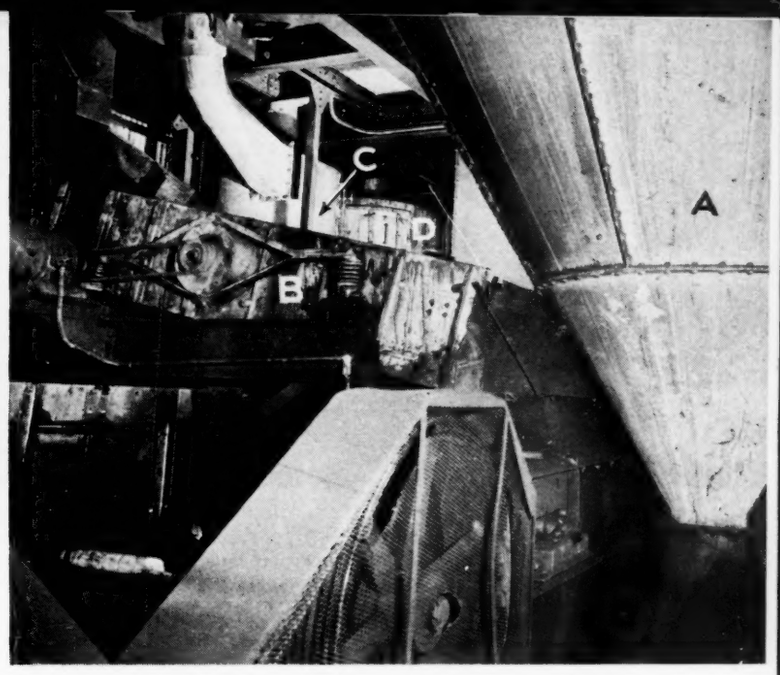
From the air cleaning plant only a slight haze of dust is visible from one small vent. Table air moves in closed circuit through a primary cyclone-type collector above each unit. Small secondary collectors of the same type and with separate fans draw a small volume of air from the bottom of the main collectors. The dust drops through a chute to the refuse drag conveyor and the air from both small collectors is discharged to the atmosphere through the one vent. Stump box blowers are driven by 60-hp. motors and the secondary collector blowers by 10-hp. motors.

A middlings product from the Stump boxes is screened on a Robins "Vibrex" unit to divert to the refuse

Flow diagram, Wayland central preparation plant (not including unit for wet recovery of fine carbon.)

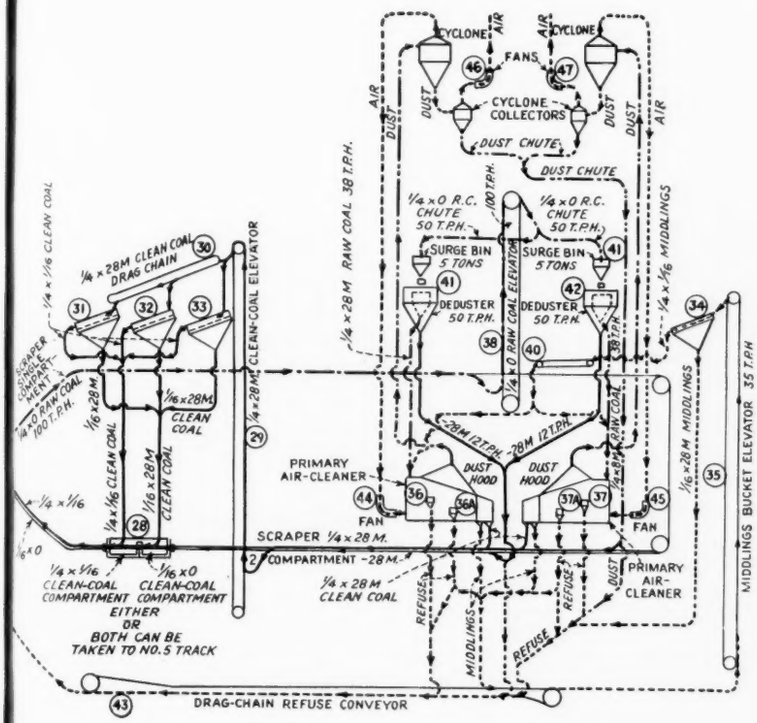


Looking into one of the new air separators, T. G. Wallance, Wayland preparation engineer, predicts low maintenance cost.

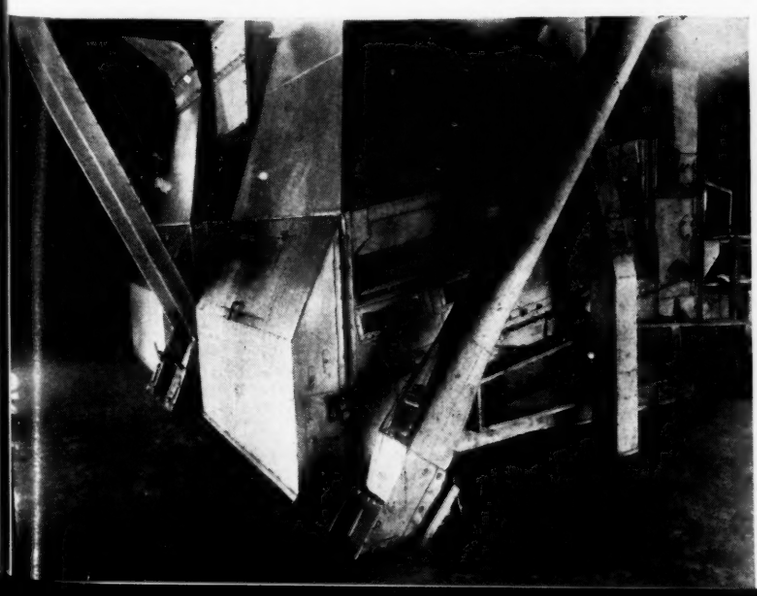


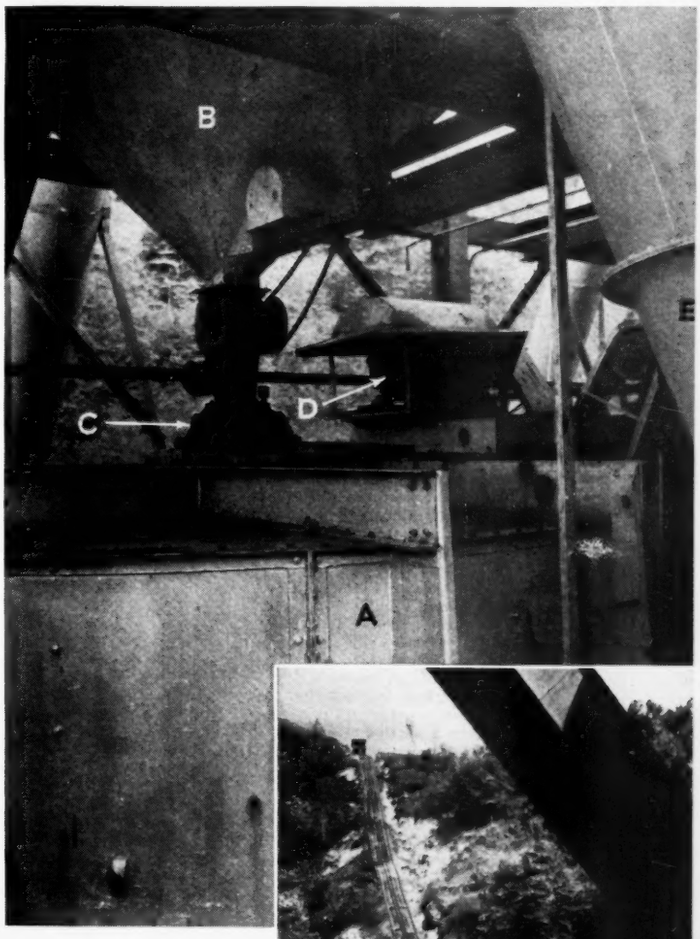
Upper floor above air cleaners. *A* is bottom section of one air separator; *B* is vibrator screening middlings from air cleaner; *C* and *D*, secondary cyclone collectors.

A, top section of air separator; *B* surge-bin feed; *C*, top of bearing of hollow drive and feed shaft; *D*, 60-hp. air separator motor; *E*, bottom, one primary collector.

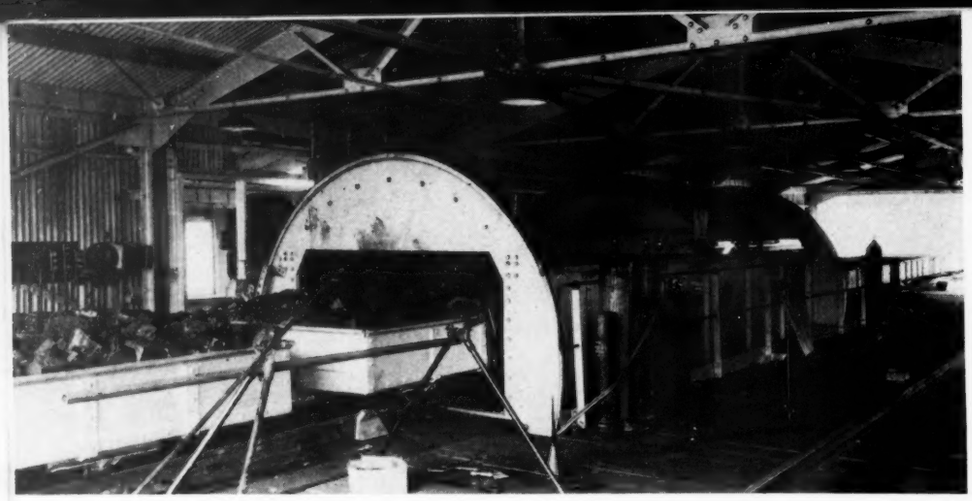


Two double-unit boxes clean 1/4-in. x 28-mesh.





Mine-plant refuse is hoisted up new four-track incline 1,150 ft. in length.



122-cu. ft. mine cars are dumped two at a time without uncoupling in this motor-driven rotary dumping unit.

the minus $\frac{1}{16}$-in. Oversize is then returned to the feeds of the boxes.

The plant is now producing a total of 3,000 tons of cleaned coal in two seven-hour shifts. Total reject is 17½ percent of which 1 to 2 percent is from picking tables, 4 to 5 percent from the dry plant and the remainder from the jig. The air boxes effect an ash reduction of 7 percent or more in the ¼-in.x28-mesh, thus making it marketable as steam coal of that size with ash under 10 percent or in blended 2-in. or 1½-in. nut-slack. Considerable has been sold in the byproduct market (less than 7 percent ash) by blending with fines of 4 to 4½ percent ash from crushing some of the 1-in.-plus washed sizes.

When the Hydrotator on order from R. & S. (to handle 27 tons per hour) is installed to reclaim carbon from the washer sludge and whizzer dust, total plant reject will be cut to approximately 12 percent. The feed to this Hydrotator will include a $\frac{1}{16}$-in.x28-mesh fraction to be made by screening the Stump cleaned product over three Robins "Vibrex" screens already in the plant and formerly used exclusively for sizing.

Contamination in the ¼x0-in. comes largely from a fireclay bottom. At present, however, two sections of the mine are in territory having a ½- to 2-in. soft parting, but development is working out of it. In some sections there is a drawslate, but it breaks into larger sizes and is so heavy that the jig readily removes it.

The Jeffrey Baum jig, as mentioned previously, was added to the plant in 1938. In April, 1942, the original dewatering screen was replaced with a new and much larger Jeffrey Parrish-type unit rated 485 tons per hour maximum, handling 5x¼-in. coal. Width is 7 ft., stroke 4 in. and speed 160 strokes per minute. The dewatering section is 31 ft. long and has 196 sq. ft. of dewatering surface. Operating in balance with the dewaterer is a classifying section 28½ ft. long.

Approximately 75 percent of the stoker coal shipped from the plant is given the Coaladd dustless treatment. The trademark, "Wayland Wasp, The Perfect Stoker Coal," on 1¼x1½-in. red paper cards or tickets is dropped into the coal by two Dustlix machines which chop the pieces from a long continuous tape.

Refuse-disposal facilities which proved inadequate for mechanical loading and mechanical cleaning, were completely rebuilt in 1942, increasing capacity, eliminating a 42-in.x300-ft. (c.-c.) belt and, for the next five years, holding the maximum larry haul to 600 ft., as compared to a previous haul of 1,100 ft. A four-rail, 1,150-ft. skip incline on a 28-deg. maximum grade was built to carry the refuse directly from a new bin under the rotary dump to the top of the hill.

New skips carry 9 tons, or practically double that hauled by the skips used on the old incline, which was built many years ago and was continued in use temporarily by installing the 300-

TABLE I—MOTOR DRIVES OF UNITS DESIGNATED BY NUMBERS ON THE FLOW DIAGRAM (PRIOR TO INSTALLATION OF HYDROTATOR)

Number	Unit	Motor Hp.	Motor R.P.M.	Motor Type
1-A	Rotary dump	15	1,000/340	5-KE
1-B	Empty car haul	30	1,040/380	KR
1-C	R.O.M. feeder	10	1,150	KG
1-D	R.O.M. conveyor	50	865	KG
1-E	Weigh basket	7½	1,730	KG
1-F	Weigh basket	7½	1,730	KG
1	Primary shaker screen	30	860	KG
2	Stoker belt conveyor	7½	1,150	PR952
3	Egg and nut scraper conveyor	15	1,155	KG
4	Scraper conveyor to washer	40	865	FTR536
5	Baum jig	10	1,745	KG
5-A	Air compressor for Baum jig	50	3,550	KF
5-B	Tank pump	15	1,750	T752
5-C	Circulating pump (600 g.p.m.)	100	1,150	AR
5-D	Jig injector motor	3	1,720	KG
6	Dewatering and classifying screens	25	865	KT
7	Crusher scraper conveyor	30	1,160	KG
7-A	Trademarking machine	¼	1,725	AC
8	Flextooth crusher	100	1,165	FTR
9	Belt conveyor to vibrators	10	1,150	KG
10	Jeffrey-Traylor vibrator	10-amp.	.....	5
10	Jeffrey-Traylor vibrator	10-amp.	.....	5
10-A	Motor-generator for vibrators	.....	1,750	.....
11	Stoker scraper conveyor	5	870	FTR
12	Egg loading boom	10½	1,150	.....
12-A	Egg loading boom hoist	4	1,025	L
13	Refuse belt conveyor	5	1,150	FTR946
14	Stoker scraper conveyor	75	1,150	FTR
15	Gyrex screen	7½	1,730	KG
16	Gyrex screen	7½	1,730	KG
17	Soft coal drag chain conveyor	7½	1,150	FTR956
18	Soft coal crusher	7½	860	KG
19	Soft coal bucket elevator	5	1,140	KG
20	Nut loading boom	10½	1,150	.....
21-A	Nut loading boom hoist	4	1,025	L
21-B	Dust layer loader hoist	15	1,610	.....
22	Lump loading boom	10½	1,150	.....
22-A	Lump loading boom hoist	4	1,025	L
23	Stoker loading boom	10½	1,150	.....
23-A	Stoker loading boom hoist	4	1,025	L
23-B	Stoker layer loading hoist	15	1,610	.....
24	Stoker elevating scraper conveyor	20	1,170	.....
25	Stoker blending apron conveyor	5	1,140	KG
25-A	Trademarking machine	¼	1,725	AC
26	Sludge scraper conveyor	5	1,720	KG
27	Refuse scraper conveyor	15	1,170	KF
28	¼-in. raw coal scraper conveyor	50	1,155	KG
29	Clean coal bucket elevator	20	1,170	OA
30	Clean coal drag chain conveyor	Driven by Unit 29 motor		
31	Vibrex screen	5	1,735	KG
32	Vibrex screen	5	1,735	KG
33	Vibrex screen	5	1,735	KG
34	Vibrex screen	5	1,735	KG
35	Middlings bucket elevator	5	1,165	OA
36	Stump box	½	1,750	OS
36-A	Stump box	½	1,750	OS
37	Stump box	½	1,750	OS
37-A	Stump box	½	1,750	OS
38	Raw coal bucket elevator	15	1,175	OA
39	Motor-generator for vibrator	10	1,750	SK
40	Middlings drag chain conveyor	5	1,165	OA
41	Whizzer air separator for dedusting	60	1,150	OA
42	Whizzer air separator for dedusting	60	1,150	OA
43	Refuse drag chain conveyor	5	1,150	OA
44	Stump box blower	60	1,170	OA
45	Stump box blower	60	1,170	OA
46	Cyclone collecting fan	10	1,750	OAA
47	Cyclone collecting fan	10	1,750	OAA
48	Air compressor for sump gates	15	1,735	KG
49	Vibrex screen	5	1,735	KG
50-A	Refuse bucket elevator	Driven by Unit 5 motor		
50-B	Refuse bucket elevator	Driven by Unit 5 motor		
50-C	Refuse bucket elevator	Driven by Unit 5 motor		

ft. belt. A new Diamond hoist with 150-hp. motor was installed at the top of the new incline and its control is semi-automatic.

While the connected load of the plant as built in 1937 was 842 hp., the present plant, refuse hoist not included, has equipment totaling 1,235 hp. Motors operate on 220 volts a.c. and of the 69 in use 6 are fractional-horsepower units. The largest is a 100-hp. machine driving a new Jeffrey "Flextooth" crusher installed to handle 197 tons per hour of washed coal. It replaced a ring-type crusher.

New motors in the air plant are Louis Allis ball-bearing units. The bank of three General Electric 200-kva. 40,000/220-volt transformers installed in 1937 are now loaded to 700 kva. and the power factor is 68 percent. Instead of dealing with this overload by replacing with larger or installing additional transformers, 220-volt General Electric capacitors have been ordered which will raise the power factor to 96, thus cutting the kilovolt-ampere load down to the transformer-bank capacity. These capacitors, totaling 360 kva., will be installed at the control boards, one 120-kva. unit in the air plant and two of the same size in the main tipple.

Added to the original equipment of 500 A.C.F. 122-cu.ft. mine cars were 250 Enterprise cars of about the same dimensions and specifications: width, 7 ft.; length over all, 13 ft. 3 in.; height above the rail, 20 in. at the rear end, and with the sides tapering up to 27 in.; 14-in. Enterprise wheels; Timken bearings No. 477-472-A; four 2¾-in. axles (open-hearth special 0.40 to 0.50 carbon steel); wheelbase, 46 in.; track gage, 42 in.; rubber bumper on one end and a spring drawhead on the other; wheel hoods and floor of ¼-in. Cor-ten steel; no brakes; swivel couplings; and retracking pockets on all four corners.

Executives of the Elk Horn Coal Corp. and others directly concerned with the Wayland plant are: receivers, Howard N. Eavenson, Pittsburgh; W. W. Goldsmith, Charleston, W. Va., and J. J. Moore, Pikeville, Ky.; general superintendent, Harry B. Crane, Fleming; superintendent of maintenance S. H. Tucker, Fleming; superintendent of Floyd County mines, R. A. Suppes; preparation engineer, Thomas C. Wallace; chief electrician, Morgan Hall; land agent, George Pow; division engineer, J. A. C. Haymond; tipple foreman, Buck Layne; and supply manager G. S. Fuller. For the Elk Horn Coal Sales Co., A. B. Brooke is the coal inspector at the plant.

CUTTING WASTE AND LOSS

Coal in Snow Hill Materials Reclamation*

Materials Care the Duty of the Section Boss—Essential to Educate Men in Value, Good Housekeeping, Prompt Reclamation, Adherence to Standards and Prompt Transfer to Places Needed

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THE CARE of all materials and supplies is one of the fundamental duties of the section boss. To him falls the duty of maintaining a supply service that will provide an adequate quantity of material properly placed for efficient use. At the same time, he must have, and must develop in his men, methods of good housekeeping that will keep all the materials on his section secure and stored in such a manner they will not be covered up, lost, and wasted.

For efficient operation it is necessary at all times to maintain a plentiful supply of these materials, and yet this very plentifulness may tend to promote an attitude of wastefulness. This will result in consequent carelessness and loss in the use and recovery of material.

Each section boss has in the section under his care material and equipment with a gross replacement value of approximately $80,000. If anything near this value is to be realized by its use, each supervisor must do his best in every way to assure the best care of materials and the most careful operation of equipment. He must also reduce the unnecessary loss of useful material to the minimum and devise ways to recover all used material for reuse.

This conservation of materials and equipment can be brought about by:

1. *The education of each and every man in the value of dollars and cents of each item of material in common use*—Every workman should be brought to think of materials not in terms of plentifulness of the article itself but in terms of value. Thus, a pair of 15-ft. rails under a piece of bad top becomes not a pair of short rails, of which there is a plentiful supply, but $12 that may be covered up and lost. A tracklayer will appreciate that when he cuts 3 ft. off a 30-lb. rail and throws it in the gob he has thrown away the equivalent of a silver dollar. A triprider will realize that if he runs over a duplex cable, making it necessary to cut out and throw away 10 ft. of this same cable, he has destroyed property worth approximately $8, or an amount exceeding his wages for that day.

Men are not by nature wasteful; and

* Abstract of Chapter X of "Talleydale Mine—Operating Procedures of the Snow Hill Coal Corp." edited by Kirk V. Campbell, instructor in mining, division of industrial arts and vocational education, Indiana State Teachers' College. Mr. Bieler is superintendent of the Snow Hill Coal Corp.; Mr. Green is mine manager, Talleydale mine; and Mr. Kyle is night boss.

if they are brought to realize the value of the material which they handle, they will be much more saving in its use and recovery.

2. *Good housekeeping in the handling, storage and use of all materials in each section and throughout the mine*—All material should be stored in a regular, orderly manner at places where the top is secure and where it is not likely to be covered by falls of rib coal. Boxes and barrels should be provided at each foreman's station for the storage of small materials such as track bolts, track spikes, fishplates and other small material. Workmen should keep only sufficient quantities of such small materials on hand trucks as will be required for their day's work, as transportation of large quantities of spikes, bolts, etc., from working place to working place may result in waste and loss.

Hiding Material Bad

All workmen should be discouraged from the practice of hiding material or tools. Hidden material is likely to be lost by being covered up. Too, the location of the material may be forgotten or the crews may be transferred to another run.

Material delivery crews should be encouraged to pick up props, ties and any other materials lying back along the roadways and take them to the face. Every effort should be made to keep ties, props, cap pieces, and other track material cleaned up as the face advances and to keep all unused material moved up instead of leaving it behind.

3. *The prompt removal of all reclaimable, useful material from all working places as soon as possible and its transfer to the proper location as soon as recovered*—Whenever the working place is finished, it should be reported to the mine boss immediately so that the material can be removed as soon as possible. After the material has been reported recovered, the foreman should carefully examine the place to see that none has been left in place.

As soon as a place is finished, the electrical force removes all feed lines, trolley wire and bonds, and the place is ready for the recovery crew.

Men are employed on both day and night shifts for the recovery of material. Four steel pullers are employed on the day shift—two on each side of the mine. These men are used to recover material in those places where the top is not too bad and where the crossbars may be removed without much danger. These men do not have a motor but use a hand truck for transporting their tools and moving the material. Each of these trucks is equipped with a set of timber tools, shovels, picks, sledges and track wrenches, and these tools are left with the truck and moved from one section to another.

When these men are sent to pull material out of a place, they should first gather up all the loose rails, ties, bars, cap pieces, and timbers and pile them back in a safe place. They should then pull up one pair of rails and set safety timbers sufficient for their protection before removing the crossbars. They should keep a record of the material collected and report it to the mine foreman at the end of a shift. The mine foreman should leave orders with the night foreman to have this material moved from that room to places where it is needed in the working section.

The recovery of crossbars is very dangerous, and the men engaged in this work should take no chances in attempting to save material. If the day crews find places that are too bad for them to recover the bars, they should report these to the night shift foreman for the night crew to pull.

Recovery Is Substantial

The average material recovery by two men on a day shift has been: two switches, 80 ties, 20 rails, 25 bars, 75 timbers, and 400 cap pieces, but this may vary somewhat, depending on the condition of the top and the amount of weight on the timbers and bars. In the recovery of material on the night shift, two men use a locomotive, one empty car, and a bar-pulling rope about 30 ft. long with a chain and hook on one end and a link on the other end to fasten on the car.

When this crew goes into a room to recover material it should first pick up all loose timbers and caps, then take up two pairs of the rails before pulling any crossbars. This will put the empty car about 30 ft. away from the bars that are to be pulled, making it safer for the men, motor and car if any slate falls. In pulling a bar, a chain should be wrapped once around the leg and then fastened so as to twist the leg out of place rather than remove it by a direct pull.

Room pulling generally is faster work than entry pulling because there are not so many bars to recover and there is more width, which gives the crew a better chance to work. On entries, both ends of the crossbars usually are against the ribs, making them hard to remove without bending them. Because of this, it is always necessary to pull both legs out from under each bar, letting the bar fall straight down. If any slate falls with the bar, it then is necessary to get the chain around one end of the bar and drag it from underneath the fall. If these bars are bent, they should be piled in a separate pile where they can be cut into 5½-ft. lengths with a torch and used for pegs in bar-drill timbering.

About 45 bars and about 15 pairs of rails will be the usual work for a motor crew on the night shift pulling material. When they have finished with a place, there should not be a thing left in the room but a few standing props. The crew pulling material at night should deliver the material pulled each night to places on the working runs where such materials are needed.

Facilities Standardized

4. *The preservation of materials for future use by standardization of installation, thus eliminating as far as possible cutting or fitting of material for one particular job*—All room and room-neck timbering, switchlaying and room tracklaying has been standardized to prevent waste of material.

The same number of bars of similar lengths are used in each room neck. Room switches are reversible, and all filler and follower rails for each number of frog are of standard length. Rails used in room work are of standard length and an ample supply of half rails and pieces is available to bring the track to the right distance from the face. This standardization makes it unnecessary to cut or recut any material, and crossbars or switches recovered from one run will be usable in similar locations in another panel with little refitting. Because of this, all crews should be discouraged from cutting steel. Instead, the place should be prepared according to standards, thus eliminating the necessity for shortening existing lengths.

5. *The prompt transfer of all material as soon as recovered to working sections where it is needed*—In our track system, with the frequent use of pick-up switches, there is available for recovery day by day material equal to that needed as the room faces advance.

At the end of each shift, each unit boss leaves orders for materials needed on his run with the night boss. These orders are filled as nearly as possible from stocks of recovered material. This insures the removal of material from worked-out territory as soon as it is pulled and keeps the quantity of material necessary for mine operation as low as possible.

ALL-OUT SAFETY

A Vital Factor in the War Effort

Maintenance of Peace-Time Safety Standards Necessary for Both Self-Interest and National Necessity—War Production Fund to Conserve Manpower Offers an Opportunity and Deserves Support

By ROBERT V. WHITE
President, The Lehigh Coal & Navigation Co.
Vice Chairman, Coal and Coke Committee, War Production Fund to Conserve Manpower

MINING is hard, dangerous work. The terrific demands of war-time industry have not made it any easier from the standpoint of either management or employee. The armed forces are making alarming inroads on a personnel which, perhaps more than in any other industry, is born to the job and simply cannot be improvised overnight. Production schedules have increased greatly in a sudden about-face, directly on the heels of one of the most trying and unstable periods in the history of coal. At the same time the industry's manpower supply is visibly shrinking.

In the first eight months of 1942 952 American mine employees were killed (bituminous, 795; anthracite, 157), against 790 in the same period in 1941. The index of fatalities per million short tons of coal produced in all coal mines edged up slowly from 2.252 to 2.265.

For many years, the coal industry has been a leader in safety work of all descriptions. These many years' intensive training of miners and foremen and the steady improvement of mining equipment and methods are a bulwark still strong, but crumbling ever so slightly under war-time strains.

Maintenance of a peace-time standard of safety, however, is necessary both on the grounds of self-interest and of national necessity. Produce coal we must. It is America's chief source of energy. To do this the skills of the industry, so hardly come by, must be safeguarded with extraordinary care. It follows that the coal industry should take a lively interest in the accident-prevention movement now spreading throughout the United States by virtue of the efforts of the War Production Fund to Conserve Manpower and the National Safety Council.

It is interesting to note that the national war on accidents represents the initiative of business and industry themselves. The few with vision and a national perspective saw a pernicious trend and determined to nip it in the bud. Thanks to this vision, safety today rapidly is becoming a national cause conferring good equally on labor, management and the general public and so contributing directly to the efficiency of the war effort.

As far back as August, 1941, a presidential proclamation warned of the "wastage of human and material resources" by accidental death and injury. The same proclamation called on the National Safety Council to organize the counterattack. The Council was entirely reorganized, enlarged and changed in many ways to undertake this task.

Funds for Safety Activities

To cope with all industrial losses through accident amounting to several billions, and to do this in a fashion thorough enough for war-time discipline, money is needed. At this juncture, business and industry have stepped forward, formed the War Production Fund to Conserve Manpower, and proposed to finance a $5,000,000 expansion of safety activities.

William A. Irvin, former president of the United States Steel Corp., was asked to accept the national leadership of the Fund, and agreed to devote the major part of his time to the task. Mr. Irvin has had a life-time of experience in an industry which was, I am told, the first to launch a methodical attack on the problem of safety. In radio speeches to a national audience, in discussions with business and industrial leaders, by letter and by phone Mr. Irvin has labored night and day to drive home the critical necessity of more and better accident-prevention.

Thomas A. Lamont, of J. P. Morgan & Co., became Fund treasurer. A national committee of over 600 members and an executive committee drawn from the larger body were formed. Today regional committees blanketing all major war-production centers are making an intensive campaign for funds. Without elaborate preparation, relying principally on the sense of duty on the home front, the Fund is making rapid strides toward its goal. Already, out of the $1,500,000 contributed to date, a quarter of a million has been allocated to the Council. This initial stimulus has accomplished tangible results in safeguarding American manpower.

On the request of the Maritime Commission, safety controls have been worked out for application in East, Gulf and West Coast shipyards. In cooperation with the Provost Marshal General's office plans are being made for the training of safety personnel to be deployed in every plant producing for the Army. Safety personnel are being trained on the request of the Department of Labor and the Office of Education. For the Ordnance Department men are being trained to maintain safety and health in the manufacture of explosives.

A serious attempt is being made to penetrate the seven out of every eight plants now without adequate safety protection, an extremely important measure at a time when small units are mushrooming overnight into subcontractors of responsibility. Every effort is being made to educate the general public through radio, press and magazines to the urgency of the situation. This is especially necessary, for unless there is a popular will behind the safety movement no permanent advances can be expected. It

Reminding all who pass of their biggest war-time job.

Underground first-aid hospital.

First-aid work, a major means of building the safety spirit.

also is important to reach outside the plant and mine, since three out of five accidents happen off the job.

These measures are being applied to an accident situation which since Pearl Harbor up through the end of November of this year accounted for the deaths of 46,300 workers, 160,000 permanent disabilities and 4,000,000 injuries, including the foregoing. A loss of 450,000,000 man-days has been recorded. In 1941, the over-all industrial injury frequency rate rose 8 percent. Though no final tabulations for this year are available, considering that industrial pressures have increased rather than slackened and taking into account the employment of great numbers of green hands, young boys, older men and women, there is every expectation of an additional rise.

There is only one answer to the accident issue in coal mining: training of personnel in safety. Some men, familiar with the coal industry's accident experience and not familiar with the safety problems of other industries, might wrongly be led to the conclusion that so specialized is the problem of mining accident prevention that its solution is an occupation in itself, a too complicated and centrally important factor to be affected by the national safety movement.

Always War on Accidents

As A. W. MacDonald, a Nova Scotia mining authority, recently said: "It is always 'war times' so far as the prevention of mine accidents is concerned." On the other hand, three out of five accidents to workers, miners included, occur off the job—in the home, coming and going to work, in leisure activities. This fact alone justifies strong support of any campaign which aims to make safety a matter of second nature to American workmen.

At the same time mining is but one segment, though a tremendously important one, in the entire industrial fabric. In war time no single industry can afford to ignore conditions in industry as a whole. All are serving a common purpose, and all will sink or swim together. Safety has become a patriotic duty, and lack of it minor treason. What will benefit industry as a whole demands the unanimous backing of all industries severally.

I strongly urge the coal industry to support the War Production Fund and to contribute its full share.

SAFETY PROGRESS
Depends Heavily on Good Supervision*

Supervisor Must Know Job

By R. J. BRENNAN
Superintendent, Midland Mine, Pittsburgh Coal Co.
Houston, Pa.

WAR developments have put our efficiency as mine supervisors to the test. Some attribute today's safety conditions to the morale and attitude created by the war emergency. I'm wondering whether or not the attitude of the supervisors has not dropped in the same proportion as that of the men. If we fold up and assume the frame of mind that nothing can be done about it, we can expect a further increase in accidents. The experience of many companies proves that accidents can be held down in spite of unfavorable conditions.

Good supervision will reduce accidents and that is the kind of supervision that requires little discipline. Of course, good discipline is necessary for the prevention of accidents. But I don't mean the "hard-boiled" kind. Disciplinary measures should be taken only when a thorough job of training and instruction has been honestly and sincerely done without success.

To become good instructors we should, first of all, know ourselves and make a thorough study of the qualifications of a good instructor. This can best be done by giving a generous portion of our spare time to a study of self-development.

There are four important guides for us in our training of men:

1. Set a good safety example.
2. Instruct each man thoroughly in the safety precautions of his job, whether he is an old or new worker.
3. Maintain all safety devices in working order.
4. Follow up safety instructions constantly.

There is no need to make your accident-prevention program complicated. Make it practical and simple. Above all, follow it up energetically and intensively for the best results. In setting a good example, we should not only develop safe working habits ourselves but we also should attack each job with an enthusiasm that will not fail to arouse safety consciousness in those with whom we associate.

"Follow through" is another very important step in safety instruction. All too often we neglect to check on our workers at frequent intervals to find out why instructions were not carried out and to see whether or not they understood the instructions and the reasons why they should be carried out.

Our past records show that we can make coal mining safe. The plight of our nation says that we must. We should take the necessary steps to enable us to say: "I will do it." If we develop the right enthusiasm, we just can't help but win this battle against accidents, for there is no defeat except to those who think defeat.

Proper Instruction Vital

By THOMAS CONEBY
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ARE we doing the job we are capable of doing in safety? Have we gotten slack with ourselves and the men in our charge? These are questions every mine supervisor might ask himself in the light of today's trend toward a higher accident rate.

We all know that our companies are in the business of mining coal and are interested in the production of coal to the fullest extent to assist our government at this time of greatest need. I do know, however, that they do not want increased production at the sacrifice of safety. We as assistant foremen know that production cannot be had unless there is safety. Safe working conditions with safe working habits will solve our production problems. In all my experience as an official I have never been able to separate safety from production. They go hand in hand. Without one you cannot have the other. If we do our part by providing safe working conditions and talk safety to our men they will do theirs.

The men we are getting today are not up to the standard of the men of but one year ago. We as supervisors must find a way to overcome the difference, and we can do it. It is a challenge to our ability as supervisors. It will mean a little harder work on our part, but we can and must do it. Mine officials, in general, are proud of their position. One of the most important things to be proud of is the safety record we can accumulate. Accidents are the result of lax working habits and the lack of proper training and instruction. Our job is to instruct and train our men to a point where they will not be lax in their habits.

How are we going to do this? The important part of training is to have the man understand fully what he is trying to do. Most men will assist us by finding better and safer ways of doing their job when they know what they are trying to accomplish. Ordering a man to do a piece of work will not get as much cooperation as when a man is carefully instructed. The workmen are no different from us. They take pride in doing a good safe job. If we handicap them by not issuing proper instructions they probably will not know what they are trying to accomplish, and if they don't know there is little to be proud about and

* Articles in this symposium conclude the abstracts of reports of addresses by representatives of the mine supervisory group at the Oct. 17 safety conference of the Pittsburgh Coal Co., held at Washington, Pa., and participated in by executives, mine supervisors and the inspection staff. Addresses by William Murphy and Roy R. Newhouse were abstracted in the December, 1942, *Coal Age*, p. 78.

very likely you will get a slipshod job.

When a man has completed a job for you, take him and check it over. If any mistakes have been made, show him where he missed out and how it should have been done. He will not make the same mistake again. If the job has been well done, you certainly can afford to praise him for it. Men are all human. We all like to be praised for a good job. A little praise makes friends.

Gaining a man's confidence is very important. Confidence is best gained by honesty and fair dealing. When you promise a man that you will give him something, be sure you make good. Be fair with all men. Treat every man alike. Play no favorites. You may be stern with your men but they will respect you for it when they know that every man is getting the same treatment. The average workman does not ask for favors. He only wants just treatment.

Know something about your men. Know something about a man's home life. Know him at work and on the street. Every man has some little personal troubles. Let him tell you about them. It relieves his mind and makes him like you. He will seek your advice about his personal troubles and about the little difficulties pertaining to his job when he finds out that he can talk to you.

Many of us make the mistake of criticising our men before others. Nothing hurts more than to be scolded before a fellow workman. You may not realize it but fellow workers enjoy reminding a man of your criticism. It doesn't go down very well and a man is constantly reminded of us in a bad light. He cannot think well of us. We must maintain the respect of our men if we are to have reasonable cooperation from them. We are lost if our men do not work with us.

Many rules are broken in the mines but they cannot be corrected by force in all cases. We must explain why the rules are made and use good common sense when enforcing them. Preach safety and practice safety.

We must keep our sections clean and in a good working condition. Take care of the little things while they are little. Little things corrected at once will never grow into big things.

Safety and production will come easy when we do the things we know how to do.

NEW SAFETY REPORT

Facilitates Study of Mining Accidents

By WALTER M. DAKE
Consultant, Coal Age

COAL MINING, long a staunch advocate of occupational safety, has marked up another achievement by leading the way to a simplified and standardized method of reporting accident data needed by federal and State agencies in their work of studying mine hazards and protecting workers from injuries.

At first glance the operator might conclude that the new accident-report form which went into use Jan. 1, 1943, merely increases the large number of forms he already must fill out. Actually, the opposite is true. The new form cuts down the number of reports required. Instead of having separate forms for the various State departments and for the U. S. Bureau of Mines one form covers them all. The National Coal Association estimates that it will save the industry 100,000 man-hours a year by reducing "paper" work.

In some instances, State compensation bureaus or industrial boards require additional information regarding accidents. When this is the case, the data can be written on the back of the regular report form, which was left blank for this specific purpose.

The new form, which is being used by 8,500 mine operators, covers 100 percent of the industry and is workable because it was devised through the cooperative efforts of State mining departments, State compensation, industrial, or labor bureaus, the Bureau of Mines, the National Coal Association and State organizations of coal-mine operators.

In the past, a variety of report forms were used in the various coal-mining states and the lack of uniformity in the data supplied by these different forms created confusion. It was extremely difficult to combine and compare with any degree of accuracy the accident statistics gathered in various states. Thus, the true picture of mine hazards and causes of accidents was somewhat blurred, and sometimes a late start was taken in adopting corrective measures.

Subsequently, this situation was improved to some extent by the use of a Bureau of Mines report form by coal-mining companies in all states. A further step in perfecting the collection of coal-mine accident statistics has now been accomplished by the adoption of the new form—6-637—which eliminates the necessity of filling out other sets of forms to supply supplemental information required by various states.

In using the new "Employer's Report of Coal-Mine Injury (Form 6-637) the required number of duplicate copies can be made simultaneously merely by using carbon paper. A form is filled out for each accident. At the end of the month the original copy of the report form and a summary of all accidents which occurred during the month are to be sent to the Bureau of Mines at Washington, D. C. The duplicate copies of Form 6-637 are used for the company filing and for transmittal to various State agencies requiring such information. Only one copy of the month's accident summary (6-637a) is required. This copy is sent to the Bureau of Mines in Washington, D. C., but no duplicate copy is required for the State agencies.

Under the old report system, a form was made out showing the date on which a man was injured and a second report was made when the man returned to work. Under the simplified system, the return date can be listed on the same form listing the injury if the man returned to work in the same

month he was injured. However, if a man still is away from work at the end of the month, a notation should be made of this fact on Form 6-637a in the succeeding month.

For example, if a man was injured in January and did not return to work that month, a notation is made in the February summary sent to the Bureau of Mines. A record of the man's injuries still will be available to the Bureau of Mines and other agencies because it will have been listed on Form 6-637, the individual accident-report form, which the company would submit for January.

Will Promote Safety

Dr. R. R. Sayers, Director of the Bureau of Mines, has emphasized the important part this new accident-report form will play in advancing safety in the industry. Under the Coal Mine Inspection Act of 1941 the Bureau was directed not only to investigate operating methods in coal mines and make recommendations for improving conditions relative to health and safety but also was given the job of obtaining, compiling and analyzing accident statistics so that additional suggestions could be made and so the industry as a whole would be better informed regarding accident trends. With a clear-cut picture of accidents and their causes, the Bureau is in a much better position to fulfill its job, and each mine also will have up-to-the-minute data which will assist in its accident-prevention program.

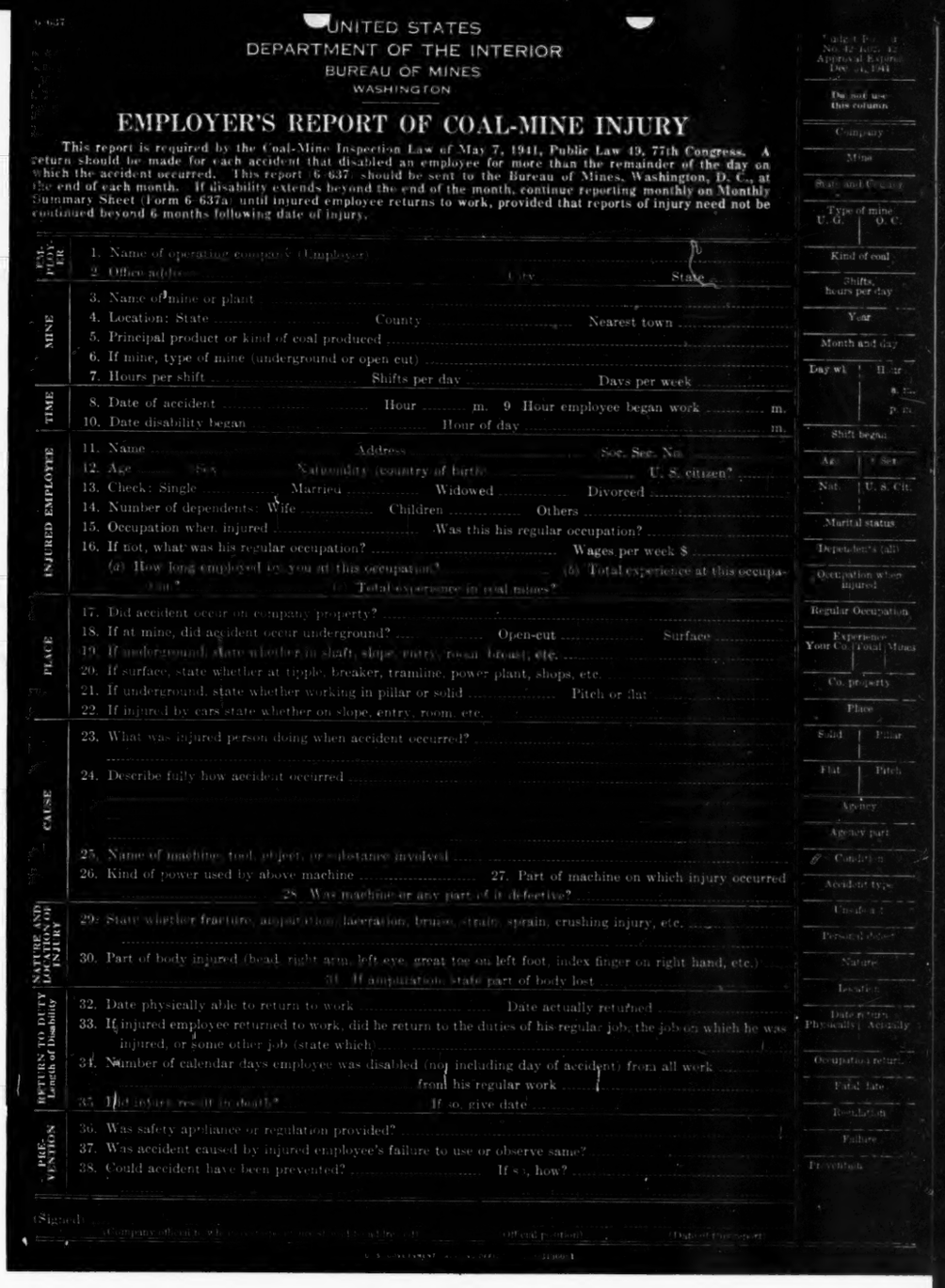
W. W. Adams, Supervising Statistician of the Bureau of Mines, who recently was directed by Dr. Sayers to consult with various State officials on the new report form, explains that uniform records will be available at the company offices when federal and State coal-mine inspectors visit mines.

In one of its recent bulletins, the National Coal Association devoted considerable space to a discussion of the new accident-report form and system. In part that bulletin stated: "The National Coal Association takes pride in reporting this achievement to its industry. We acknowledge the excellent cooperation of the Bureau of Mines, of each and every one of the State mine departments and industrial or compensation bureaus, and of the producing groups in the various states, without whose helpful work this standard form could not have been achieved.

"In very few instances it was necessary that the subject be presented to the State mine departments by correspondence, and for the industry's information attempts will be continued to have the standard form adopted by the mine departments and by the State industrial or compensation departments who have so far not signified their willingness to accept it."

It might be added that in some instances immediate adoption of the new report form for State use was prevented because State law prohibited utilization of a different form by State agencies in obtaining accident statistics. However, in at least one case the State has requested that it be given copies of Form 6-637 by the mine operators because of the excellent manner in which the data are listed. In all, 85 percent of the tonnage of the United States is represented by states that have adopted the new form.

Operators seeking additional copies of Form 6-637 bearing the Department of the Interior filing mandate at the top and copies of the monthly summary form, 6-637a, should write to the Bureau of Mines, Washington, D. C. Duplicate copies of Form 6-637, which are printed with the filing mandates of the various states, are to be distributed by the State agencies concerned, and requests for additional copies of such forms should be made to the states.



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON

EMPLOYER'S REPORT OF COAL-MINE INJURY

This report is required by the Coal-Mine Inspection Law of May 7, 1941, Public Law 49, 77th Congress. A return should be made for each accident that disabled an employee for more than the remainder of the day on which the accident occurred. This report (6-637) should be sent to the Bureau of Mines, Washington, D. C., at the end of each month. If disability extends beyond the end of the month, continue reporting monthly on Monthly Summary Sheet (Form 6-637a) until injured employee returns to work, provided that reports of injury need not be continued beyond 6 months following date of injury.

EMPLOYER
1. Name of operating company (Employer)
2. Office address ... City ... State

MINE
3. Name of mine or plant
4. Location: State ... County ... Nearest town
5. Principal product or kind of coal produced
6. If mine, type of mine (underground or open cut)
7. Hours per shift ... Shifts per day ... Days per week

TIME
8. Date of accident ... Hour ... m. 9. Hour employee began work ... m.
10. Date disability began ... Hour of day ... m.

INJURED EMPLOYEE
11. Name ... Address ... Soc. Sec. No.
12. Age ... Sex ... Nationality (country of birth) ... U. S. citizen?
13. Check: Single ... Married ... Widowed ... Divorced
14. Number of dependents: Wife ... Children ... Others
15. Occupation when injured ... Was this his regular occupation?
16. If not, what was his regular occupation? ... Wages per week $
(a) How long employed by you at this occupation? ... (b) Total experience at this occupation?
(c) Total experience in coal mines?

PLACE
17. Did accident occur on company property?
18. If at mine, did accident occur underground? ... Open-cut ... Surface
19. If underground, state whether face, shaft, slope, entry, room, breast, etc.
20. If surface, state whether at tipple, breaker, tramline, power plant, shops, etc.
21. If underground, state whether working in pillar or solid ... Pitch or flat
22. If injured by cars, state whether on slope, entry, room, etc.

CAUSE
23. What was injured person doing when accident occurred?
24. Describe fully how accident occurred
25. Name of machine, tool, object, or substance involved
26. Kind of power used by above machine ... 27. Part of machine on which injury occurred
28. Was machine or any part of it defective?

NATURE AND EXTENT OF INJURY
29. State whether fracture, amputation, laceration, bruise, strain, sprain, crushing injury, etc.
30. Part of body injured (head, right arm, left eye, great toe on left foot, index finger on right hand, etc.)
31. If amputation, state part of body lost

RETURN TO DUTY (Length of Disability)
32. Date physically able to return to work ... Date actually returned
33. If injured employee returned to work, did he return to the duties of his regular job, the job on which he was injured, or some other job (state which)
34. Number of calendar days employee was disabled (not including day of accident) from all work ... from his regular work
35. Did injury result in death? ... If so, give date

PREVENTION
36. Was safety appliance or regulation provided?
37. Was accident caused by injured employee's failure to use or observe same?
38. Could accident have been prevented? ... If so, how?

(Signed) ... (Company official) ... (Official position) ... (Date of report)

Do not use this column
Company
Mine
State and County
Type of mine U. G. / O. C.
Kind of coal
Shifts, hours per day
Year
Month and day
Day wk. / Hour a. m. / p. m.
Shift began
Age / Sex
Nat. / U. S. Cit.
Marital status
Dependents (all)
Occupation when injured
Regular Occupation
Experience: Your Co. / Total, Mines
Co. property
Place
Solid / Pillar
Flat / Pitch
Agency
Agency part
Condition
Accident type
Classification
Personal defect
Nature
Location
Date returned: Physically / Actually
Occupation return
Fatal date
Resolution
Failure
Prevention

This new form serves for both federal and State reports.

CONVEYOR LAYOUT

Cuts Working Area, Simplifies Operation

Uninterrupted Operation Obtained With Short Mother Conveyor in Combination Advance and Retreat System—Conveyor Moved Intact—Working Area Cut—Materials Saved—Operation Simplified

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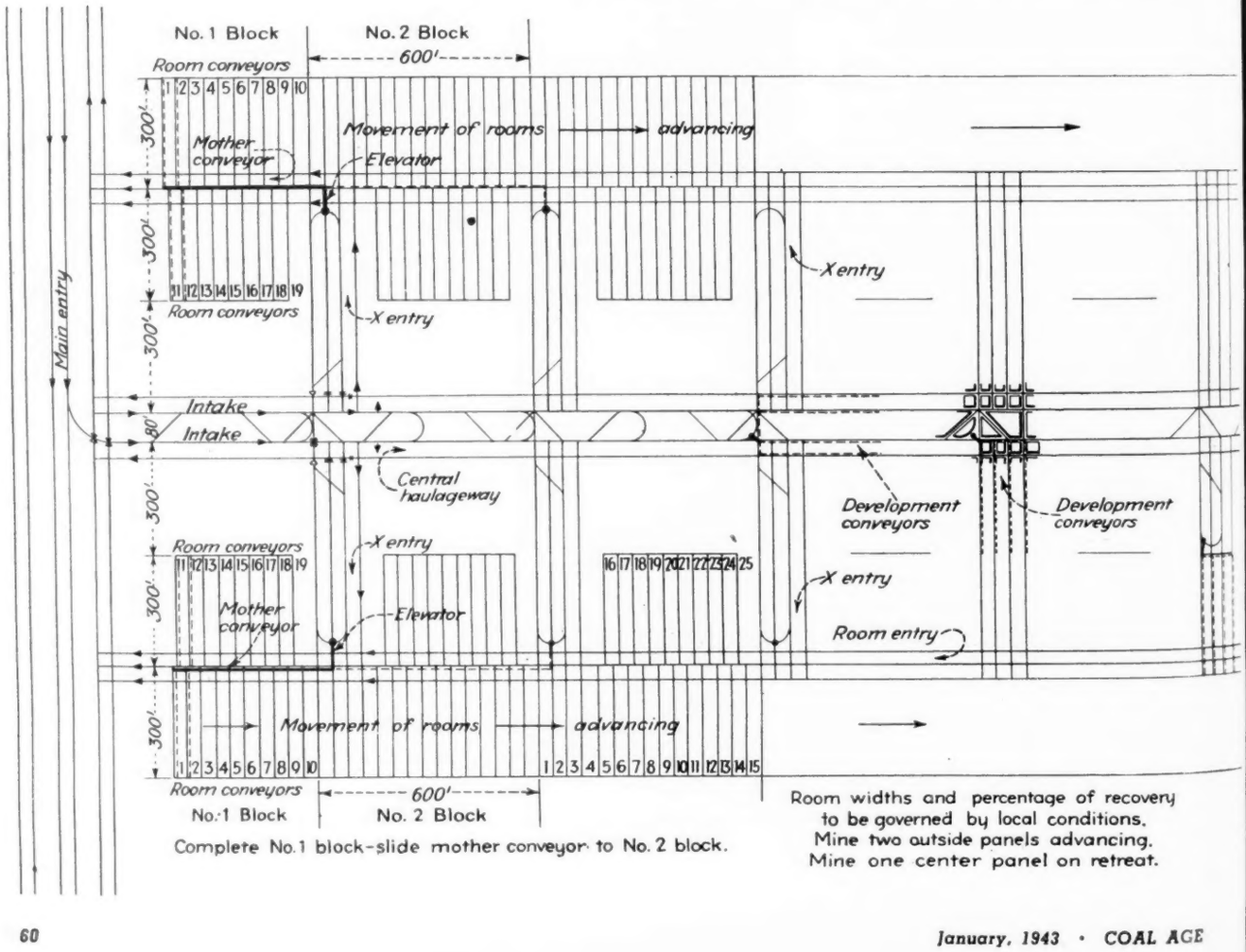
UNDER the conventional plans for conveyor mining, uninterrupted movement of coal from room conveyors can continue in proportion to the length of the mother conveyor, ranging usually from 300 to 3,000 ft. Inasmuch as a mother belt conveyor 3,000 ft. long represents a considerable investment, the writer, after long study, proposes a mining plan to attain uninterrupted production with a short mother conveyor, say 600 ft. It offers an opportunity to move this conveyor intact and in a straight line rather than dismantling and moving to a parallel entry. The layout uses loop or circle haulage, simplifies drainage and cuts in half the working area, length of air travel and quantity of track and power-line materials.

The main entrance for the haulage is in the center of the triple panel area (Fig. 1) rather than along one side. Rooms in the side panels are mined advancing and those in the center retreating. A distance of 600 ft. between four-heading cross entries was selected because it is the length of two 300-ft. room conveyors. Should longer room conveyors be used to develop the room entries off the cross entries, then the spacing between cross entries may be lengthened to correspond.

Fig. 1—General features of the proposed advance and retreat conveyor layout.



Another reason for this 600-ft. dimension is that it works in with the idea of sliding the mother conveyor ahead intact, provided the entire unit is suitably fastened together, and the stands are fitted with short sledlike skids. This will effect a saving of man-hours in moving as well as make possible the 600-ft. move at a time when the regular production crew is off duty. Very close timbering is possible in the room entry into which the mother conveyor is advanced because this entry is developed by conveyor.

On the central haulway the plan includes a Y for each cross entry. This track system uses one set of switches serving both cross entries, the connection between them being a three-way switch and a standard crossing at the central haulageway. Sidetracks have been provided at each cross entry and, due to the extremely short haul, one gathering locomotive can serve eight room conveyors and four development conveyors if necessary.

A comparison of acreage under development by the central haulage plan as against a conventional plan where the panel is to one side appears in Fig. 2. One reason for the favorable comparisons in rail and wire is that

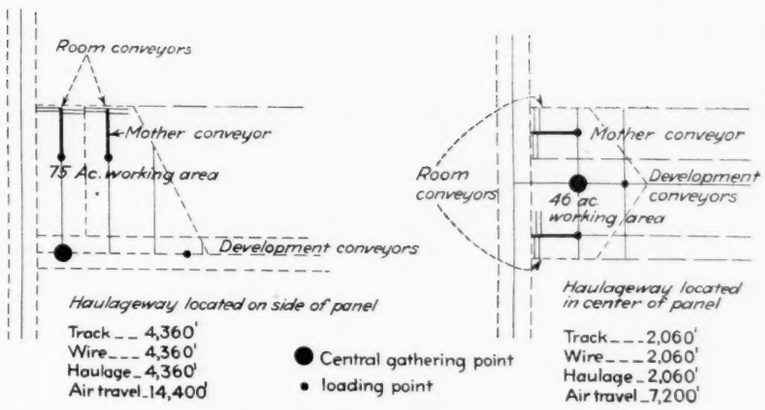


Fig. 2—Comparison of conveyor-mining systems.

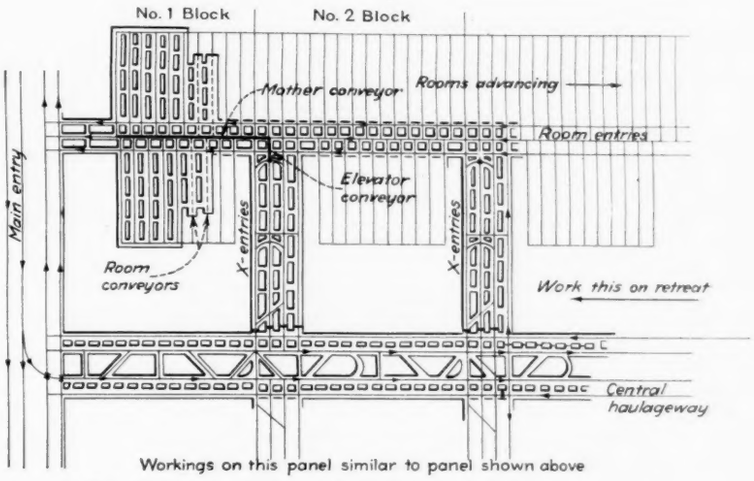
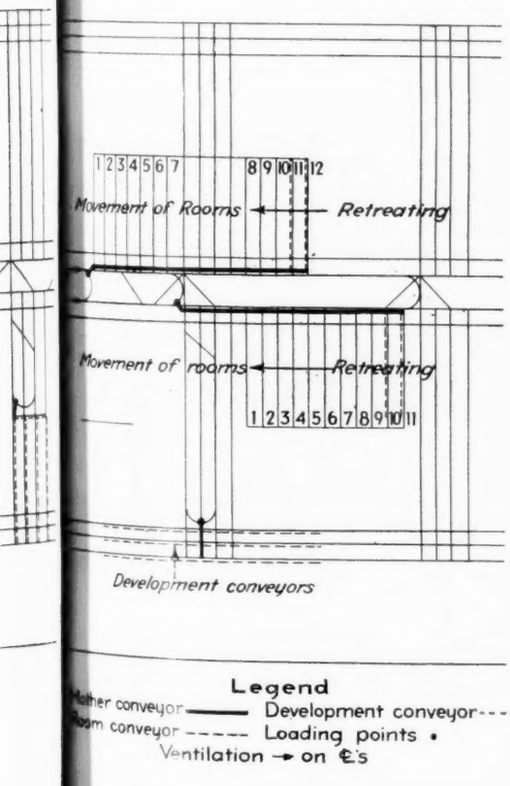


Fig. 3—Typical small working section in proposed layout.



the room conveyor on the outside of the room entry moves the coal 300 ft. toward the central haulway. Thus, counting both sides, 600 ft. of track is eliminated from the 1,880-ft. width of triple panel.

It is a proved fact that, because of better supervision, higher tonnage is obtained per room conveyor by having only one room conveyor on each side of the mother conveyor. This is less feasible with a panel having the entrance to one side.

Ventilation is counter to the travel of the coal and moves in the same direction in the three headings of the room entry. The plan appears to clear up many difficulties which have been encountered heretofore by using loop or circle haulage to secure maximum loading efficiency at the conveyor elevator. Very little re-coursing of the air is done and a minimum number of doors and stoppings are required.

Fig. 3 is a more detailed drawing of the central haulage and one side of the triple panel. The development work arranges itself so as to present twelve working places at the entrance to the cross entries; next, four working places on both the central haulageway and cross entry; and, finally, six places on the room entry. All auxiliary fans or blowers may be located in fresh air without the necessary extra lengths of tubing now being used.

Power distribution, especially for the locomotive haulage, is simplified by the short cross entries. Mining machines and drills are the only units that require power out farther than the room entry.

Close study of the plan will reveal that a very efficient drainage system can be devised for seams that have a general pitch. If the central haulage entry is driven to the dip or rise, then the cross entries and rooms are on the strike. Drainage of a room entry is less troublesome than drainage of rooms.

In this proposed new layout for conveyor mining there is the possibility of the necessary flexibility in planning the workings to suit different types of conveyors to local conditions.

BETTER BUSINESS
Follows Schuyler Modernization Work

New Dragline and Steel Tipple With Washing Tables Improve Schuyler Market Position — Cutting Ash From 18 to 8 Percent Boosts Sales of Screenings — Good Facilities Speed Both Rail and Truck Shipments

COMPLETE revision of its production and preparation facilities within the last year has enabled the Schuyler Coal Corp., a combined truck-rail shipper operating near Rushville, Ill., and stripping the No. 5 vein of coal, to increase production materially and offer a quality product, especially screenings.

Stripping now is accomplished entirely by a 621S Page walking dragline bought in 1942. It is equipped with a 135-ft. boom and a 6-cu.yd. bucket. A 7-yd. bucket has been purchased recently, however, to be used where overburden will permit. The bucket motions are gear-driven by a Page diesel engine, controlled through the medium of air-operated clutches. The walking mechanism also is operated by a gear drive from this engine. On a deck above the main engine is a smaller Page diesel driving the generator which powers the swing motion. Two Westinghouse vertical motors, symmetrically placed on either side of the cab, operate the swing motion. The use of two motors reduces the weight of gears and pinions and balances the entire machine.

Working in overburden about 35 ft. in thickness, approximately 800 tons of coal is uncovered per 24-hour day. There is some limestone just above the coal seam that must be drilled and shot. Loading is done with a 1¾-cu.yd. diesel-driven Marion shovel into 6-ton Ford trucks equipped with V-8 engines. The haul to the preparation plant is 2½ miles, most of it over a concrete highway that passes by the plant. Trucks are backed up a ramp to dump into the raw-coal bin.

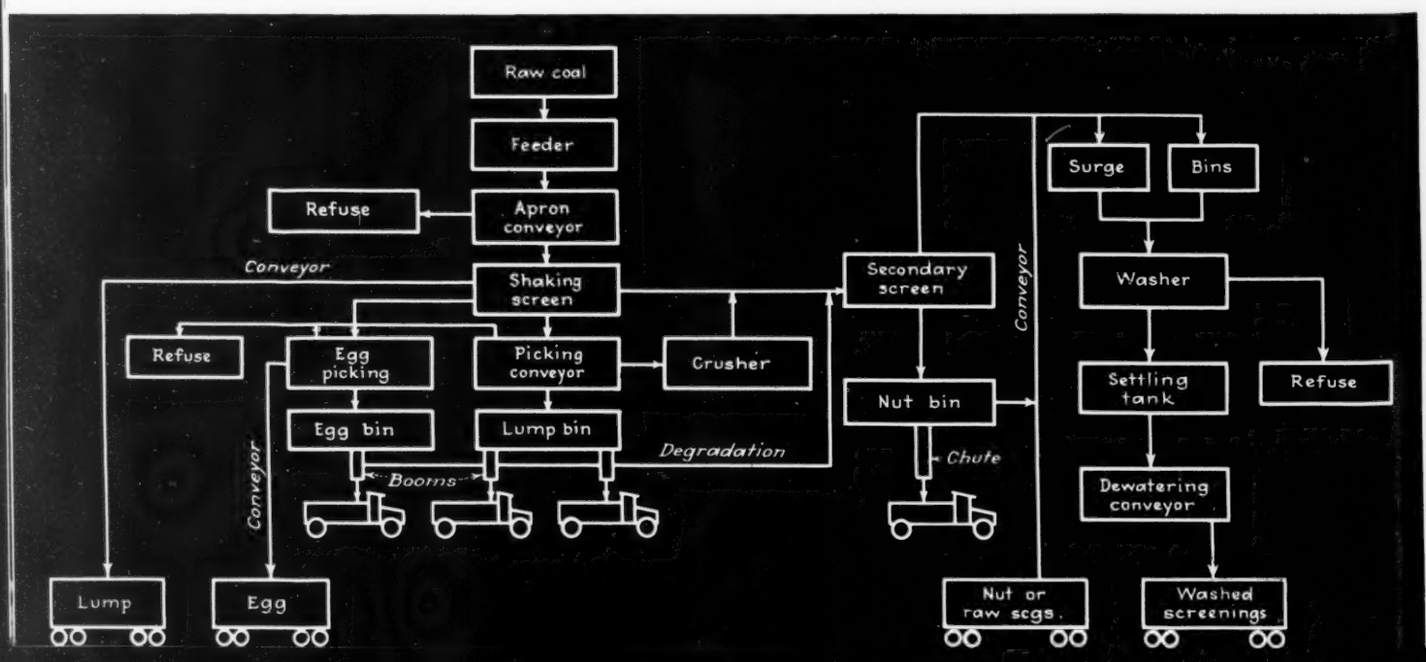
The preparation plant comprises a used Link-Belt steel tipple with screening facilities and storage bins with loading booms with a capacity of 700 tons. The plant originally was installed near Saginaw, Mich., and was dismantled and reerected by C. E. Barding, Schuyler Coal Corp. superintendent, with his own men. An apron-type raw-coal conveyor, track-loading conveyors and other items were added to fit the structure to the new conditions.

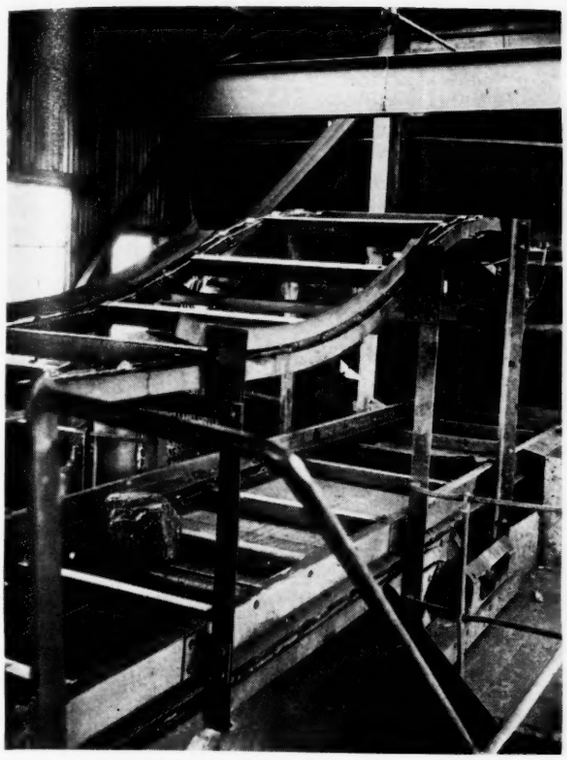
An unusual feature of this plant is the combined conveyor and picking table for the lump coal. The bottom of the trough of this conveyor is built of flat overlapping steel sheets, shingle fashion, fastened to the links of a pair of conveyor chains. While the chains return completely around under the bin, the steel sheets extend only far enough to reach the farthest spiral lowering chute in the lump-coal bin. This adjustable trough bottom is moved back and forth as needed by a reversible motor and gear train.

The 1¼-in. raw screenings, containing ash up to 18 percent, were difficult to market in the raw state. As at other strip mines, considerable clay and shale is loaded with the coal. Consequently, a wet washing plant with a capacity of approximately 60 tons per hour was installed in the summer of 1942 to clean this coal. The logical place for this equipment was in the rather cramped space under the steel tipple, but the installation was successfully made, as indicated in the illustrations.

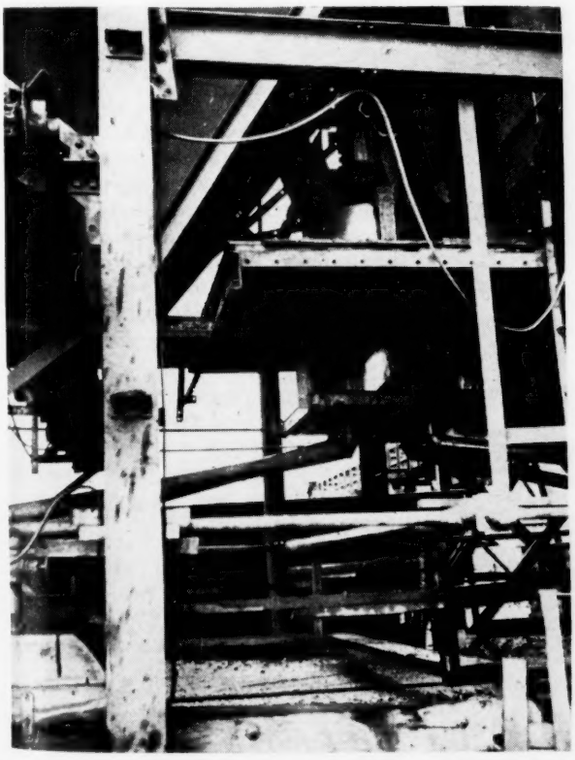
The washing equipment consists of four Deister Concentrator Co. Superduty No. 7 diagonal-deck coal-washing tables, a "Concenco" four-way-split revolving feed distributor, 1,000-g.p.m. Carver centrifugal pump, concrete settling tank and the necessary coal-feed and water connections.

Flowsheet of the Schuyler preparation plant.



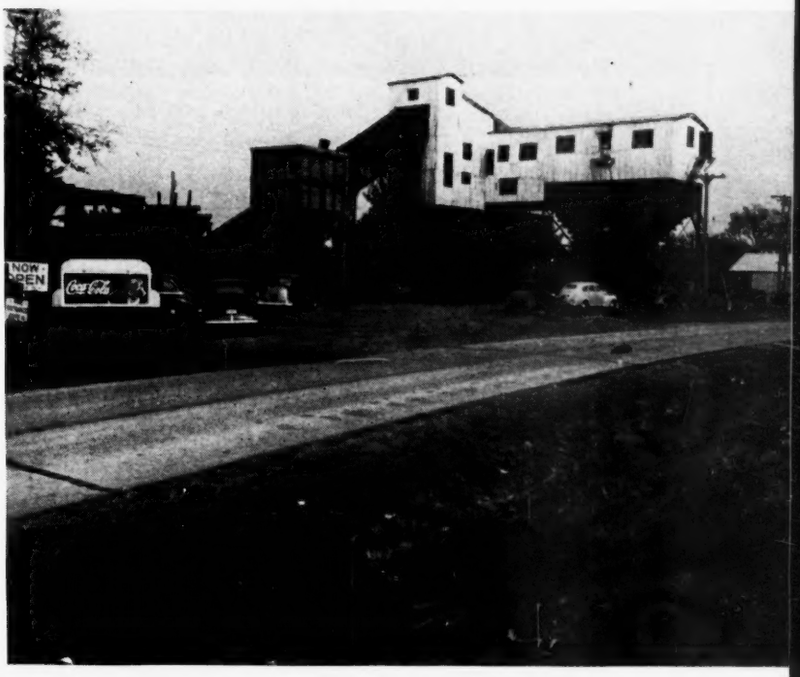


Combination lump conveyor and picking table. All coal is eased to the bottoms of the bins on coal or spirals. Movable conveyor bottom (note chain on near side) may be shifted by reversible motor to either spiral.



This revolving feed distributor feeds four coal-washing tables (see next page).

New dragline at work in Schuyler stripping.



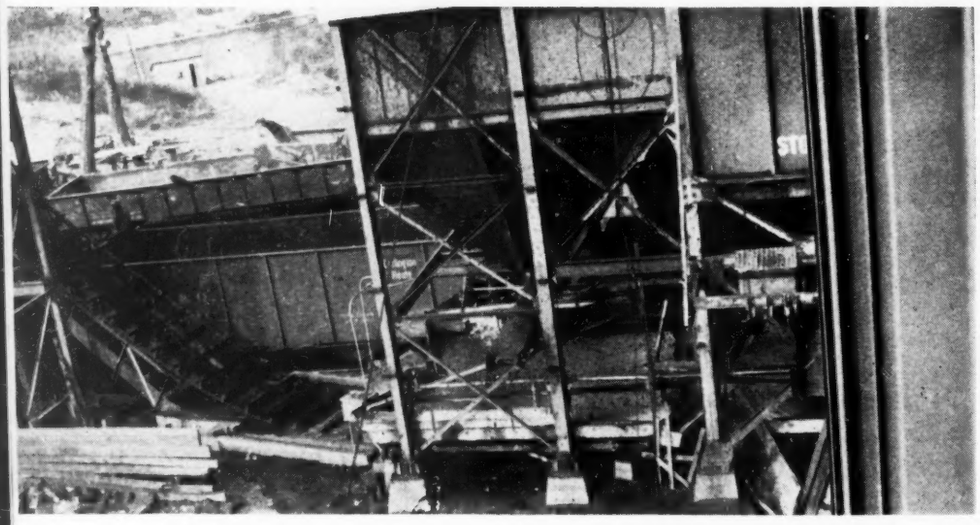
Schuyler preparation plant on concrete highway. Railroad is in rear.

Conveyors for loading railroad cars. The flat conveyor loads nut and raw screenings from bins; long and short inclined units, lump and egg from shaker screens.

A flight conveyor for taking coal from the settling tank and delivering it to railroad cars and a bucket elevator for delivering refuse to a loading bin complete the list of washery equipment.

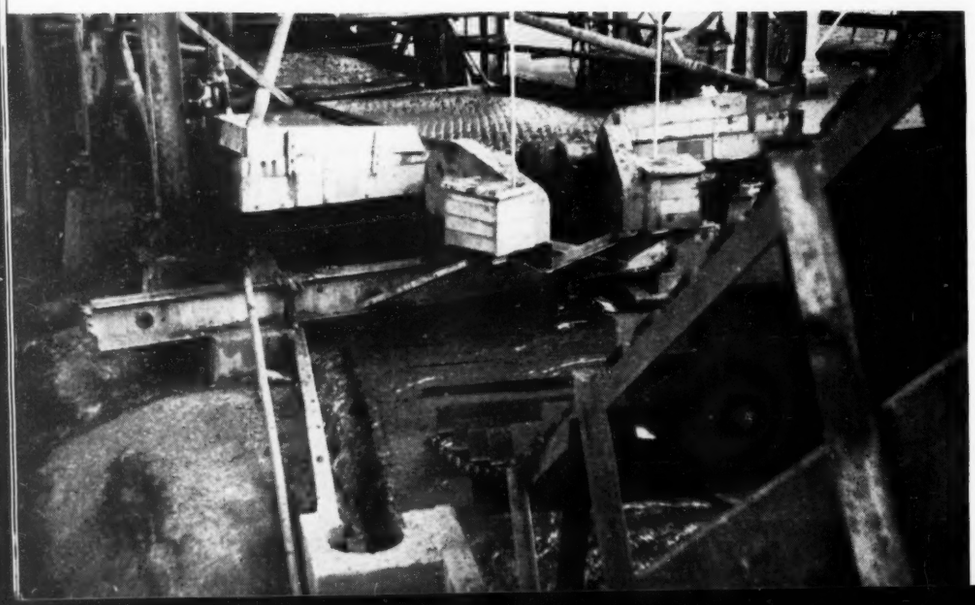
Each table is driven by a 3-hp. motor with V-belt to the head motion.

Loading a truck with egg coal over a scraper-type boom.



Washing tables (not yet housed in) were set under the screenings storage bins. Left is the dewatering and loading conveyor. Pump and water supply are across the tracks.

Close-up of washing tables and settling tank, showing overflow weir on one side.



The tables, 8x20 ft., have various adjustments of stroke and slope to promote the separation of coal from the impurities.

One of the essential conditions for feeding coal to this type of washing equipment is a uniform mixture of coal and water so the coal will be carried through the feed pipes without clogging and will spread uniformly over the tables. This is accomplished by the revolving feed distributor. From the mixer four 5-in. pipes carry the coal and water to the feed points of the four tables. Additional water is added on the tables as required, making the total per table about 250 g.p.m. In action, most of the coal is floated over the riffles in the first third of the table length. The heavy material discharges off the end farthest from the feed point. The space between is where the division of the "middlings" is finally made. This division point can be adjusted to vary the ash content of the finished product—within limits. The refuse is flushed into a bucket elevator and discharged into a bin for trucking back to the pit.

Clean Coal to Tank

The clean coal, together with dissolved clay, falls directly into a settling tank under the tables. This tank, about 6 ft. wide and 25 ft. long, is provided with a 12-ft. skimming weir on each side. Over these weirs passes the entire flow of wash water on its return to the supply pond, carrying with it clay and fine coal in suspension. A slow-moving flight conveyor, with long flights, moves the coal from the bottom of the settling tank up an incline, where the water drains out and eventually deposits it in railroad cars. Facilities for storing washed screenings in truck-loading bins are in process of construction.

Installation of the washing equipment has had gratifying results in the form of more business. By reducing the ash from 18 to 8 percent, a superior fuel is obtained from screenings that formerly were difficult to dispose of.

The goal in handling sales is to ship all steam coal by rail and domestic fuel by truck. A certain amount of steam trade is sought to make round-the-year operation profitable. Sizes made are: 4- or 6-in. lump, 6x2- or 4x2-in. egg, 2x1¼-in. nut and 1¼x0-in. raw or washed screenings. Coal reserves have been acquired for perhaps 20 years of operation.

SPLIT AIR CURRENTS

Promote Safe, Low-Cost Mine Ventilation

Splitting Air Currents Has Ten Major Advantages Growing Out of More Air, a Lower Power Cost, Greater Safety and Increased Mine Efficiency—Savings and Advantages May Be Calculated in Advance

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SPLITTING air currents in mine ventilation has many advantages, but few have a real understanding of the subject. When a foreman is having trouble getting sufficient air at the working face, it is difficult for him to understand how splitting will help. Where there is no definite ventilating plan it usually will require more expense to make the change than the foreman can undertake—or get the company to authorize without a definite estimate of the savings or advantages.

Splits Mean Lower Cost

Without planning and the cooperation of the management, ventilation is likely to be by continuous current or extremely long unbalanced splits. Sometimes the layout of the workings makes it difficult to get economical ventilation by splits. Nevertheless, splits mean lower power costs, in addition to greater safety and efficiency in mine operation. It is the purpose of this discussion to show how savings and advantages resulting from splitting may be estimated in advance.

The advantages of splitting ventilating currents are:

1. Pressure near the fan is reduced for the same volume of air delivered to the mine, thus cutting power cost.
2. A larger volume of air can be delivered to the mine. If the change from continuous current to splits permits the same volume at the fan with half the pressure, over 40 percent more could be delivered at the original pressure.
3. Leakage is materially reduced by the lower pressure.
4. Fewer men work in the same air current and they get fresh air not contaminated by gas, dust and smoke from other sections of the mine.
5. Impurities are delivered to the return airways more quickly.
6. If an excessive quantity of gas occurs in a split it can be removed quicker and with less danger than from a continuous air current, which would affect a larger area.
7. If an explosion should occur it likely will be confined to the split and the deadly gases may be directed largely toward the return airway instead of spreading over a larger working area.
8. A mine fire is not so dangerous when it is on a split, as it is easier to control and extinguish.
9. The volume of air to be delivered can be regulated more readily to the different mine sections.
10. A few overcasts may reduce the air velocities and pressure along the main haulways; reduce leakage at and upkeep of doors and stoppings; add to safety; and speed up haulage.

The effects of splitting air currents can best be shown by examples: In Fig. 1, a blower fan at *A* delivers 70,000 c.f.m. to the mine at a 2-in. water gage for a continuous circuit. This is reduced by leakage to 40,000 c.f.m. at *B*, where the pressure is 1 in. between *B* and *F*. At *C*, leakage has reduced the air to 28,000 c.f.m., but the leaking air unites with the return air so that it is again 40,000 c.f.m. at *D*. The pressure drop for each of these sections, *BCD* and *DEF*, is ½ in. w.g.

In Fig. 2, the air is split at *B*, with an equal volume to each split, without repairing stoppings to reduce leakage. With 20,000 c.f.m. to each split, the pressure required to move the air in *BCD* or *DEF* would be reduced to 0.125 in. w.g. Since they are independent of each other, this pressure moves the air in both splits and the pressures for *BCD* and *DEF* are not added as in the case of the continuous current. With 70,000 c.f.m. at *A*, this would make the total pressure at the fan 1.125 in. w.g., but the reduction in pressure due to the splits will reduce the leakage between *A* and *B*, and there will be more than 40,000 c.f.m. at *B*, so the required pressure will be increased between *A* and *B* and also for the splits. With 70,000 c.f.m. and a 2-in. w.g. at the fan, the leakage between *A* and *B* is 30,000 c.f.m.

Calculating for Splits

With the same volume of air at *A*, there is no exact method of determining the volume that will be left at *B* as a result of splitting and reduced pressure at the fan but one can come sufficiently close by trial calculations. As the pressure change at *B* is not due to a change in air volume at the fan, the mean volume of air between *A* and *B* must be used in determining the pressure drop between these points. In the absence of additional readings, the mean volume may be considered as half the total of the air at *A* and *B*.

Maintaining 70,000 c.f.m. at the fan, it can be assumed that the volume at *B* is increased to 48,000 c.f.m., with 24,000 c.f.m. for each split, due to splitting and reducing the pressure. Consequently, the mean volume of air between *A* and *B* would be 55,000 c.f.m. with the continuous current and 59,000 c.f.m. with the split current. The pressure drop for the 55,000 c.f.m. is 1 in. w.g., the same as for 70,000 c.f.m., with 30,000 c.f.m. leakage between *A* and *B*. For 59,000 c.f.m., it would be X in the equation 55 squared is to 59 squared as 1 in. is to X, or 1.15 in. w.g. The pressure for the splits would be X in the equation 20 squared is to 24 squared as

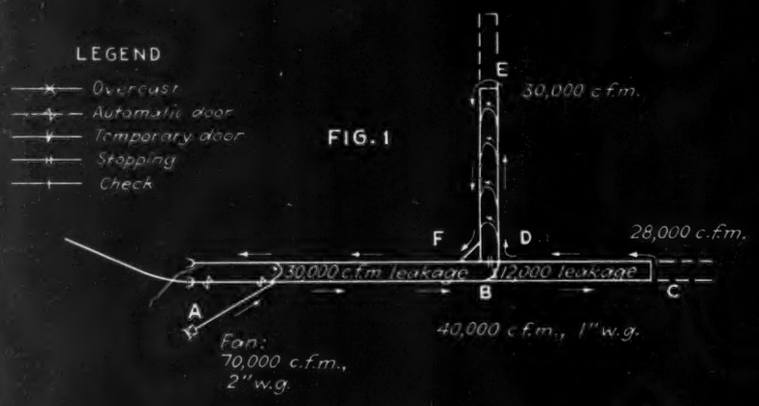


FIG. 1

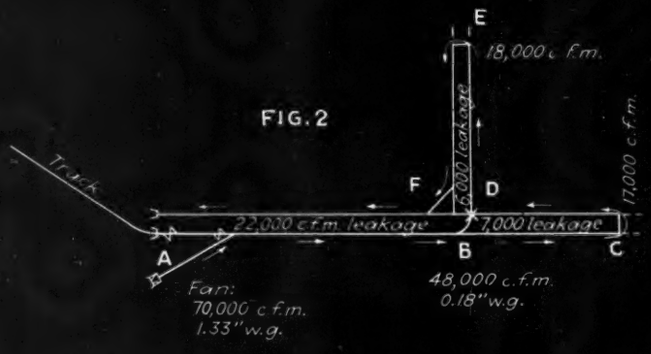


FIG. 2

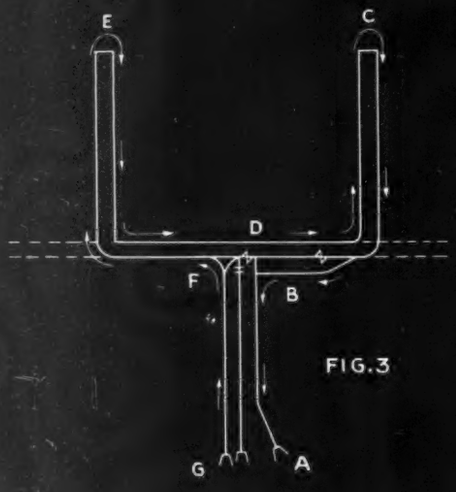


FIG. 3

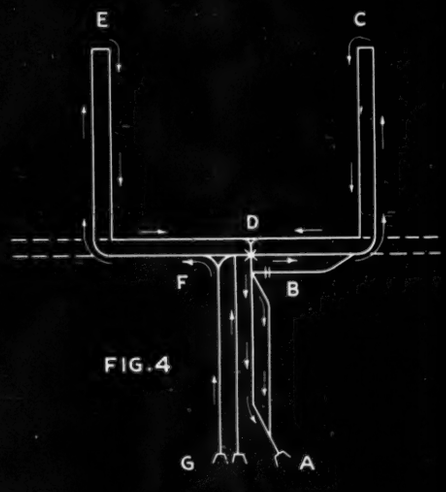


FIG. 4

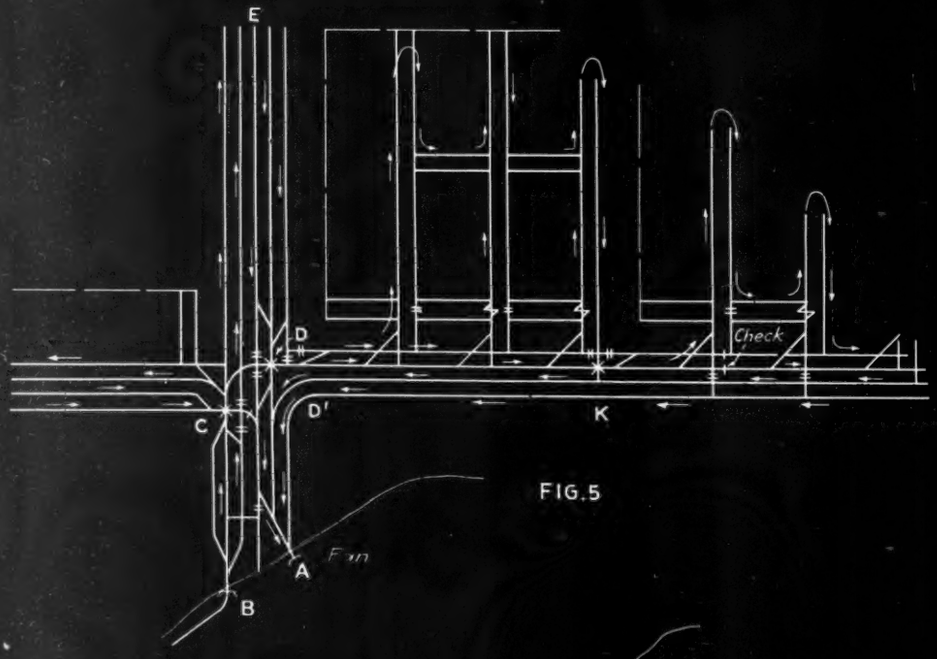


FIG. 5

0.125 in. is to X, or 0.18 in. w.g., and the total pressure at the fan would be 1.33 in. w.g.

Checking the leakage between *A* and *B*, we would use the mean pressure and have an equation as follows: half of 2 in. plus 1 in. is to half of 1.33 in. plus 0.18 in. as 30,000 squared is to X squared. The leakage with the air current split at *B*, therefore, would be about 21,300 c.f.m., and there would be 48,700 c.f.m. at that point. This is a little more than was assumed as a trial, but the actual place and volume of leakage and the varying resistance of the entries between *A* and *B* would change the results somewhat if these data were gotten in the mine, so we will hold to the 48,000 c.f.m. we have assumed at *B*. As a result of the splits, the volume of air at *B* will be increased over 20 percent—with one-third less power.

Less Pressure by Splitting

The fan has been assumed to be blowing and the intake airway to be the haulway to make the explanation clearer. With the continuous current it is necessary to have sufficient pressure at *B* to force the air forward through entries *DEF*, as well as *BCD*, so the water gage at *B* for ventilating *BCDEF* is 1 in. With equal splits and the same volume of air at *B*, only one-eighth the pressure is required at *B* for Sections *BCD* and *DEF*. With 24,000 c.f.m. in each split, the volume to be expected at *C* will be about 17,000 c.f.m. (X in the equation 40,000 is to 28,000 as 24,000 is to X). The leakage has been reduced from 12,000 c.f.m. with the continuous current to 7,000 c.f.m. with the split currents. At *E*, 18,000 c.f.m. may be expected (X in the equation 40,000 is to 30,000 as 24,000 is to X). The volume at *C* and *E* is less with the splits, but each section gets fresh air and there is 20 percent more air at *B*. At the same time, the split system requires only about two-thirds the power of the continuous current.

If it is desired to increase the air 10 percent at *C* it will be necessary to increase the volume for that split by more than 10 percent; to reduce leakage by improving the stoppings; or to increase the air at the fan by 10 percent. In the first, there will be increased leakage between *A* and *B*, due to the higher pressure in addition to the former percentage of leakage from *B* to *C*. Let us increase the air for Split *BCD* and assume 27,000 c.f.m. at *B*. Then 20 squared is to 27 squared as 0.125 in. is to X, and X

equals 0.23 in. w.g., the revised pressure for this split.

A regulator will be required in the second split to maintain 0.23 in. and the desired volume of air at *C*. Considering the total air at *B* to be 48,000 c.f.m., this will leave 21,000 c.f.m. for Split *DEF*. Leakage will be nearly 7,000 c.f.m. (X in the equation 0.5 in. is to 0.23 in. as 10,000 squared is to X squared). This will leave about 14,000 c.f.m. at *E*. In *BCD*, the percentage of air delivered to the face will be about the same as before, and the air at *C* will be X in the equation 40,000 is to 28,000 as 27,000 is to X. This shows about 19,000 c.f.m. at *C*, an increase of slightly more than 10 percent. It will be noted that the increased air in the first split makes the pressure for the splits 0.23 in. w.g. and the pressure at the fan is increased to 1.38 in. Also, use of the regulator cuts total air at *C* and *E*.

Increasing Volume

With 70,000 c.f.m. at a 1.33-in. w.g. at the fan, 18,000 c.f.m. at *E* and 17,000 c.f.m. at *C*, it is desired to increase the volumes at *C* and *E* 10 percent without reducing leakage by improved stoppings. This will require 10 percent more air at the fan, and the volumes at other points will be: 77,000 c.f.m. at *A*, about 52,800 c.f.m. at *B*, 18,700 c.f.m. at *C* and 19,800 c.f.m. at *E*, as the volumes will be increased proportionately if new and larger leaks do not develop. The pressure at the fan will be increased to 1.6 in. w.g. (X in the equation 70 squared is to 77 squared as 1.33 in. is to X).

For the problems based on Figs. 1 and 2, we have:

70,000 c.f.m. at A, continuous current; w.g., 2 in.; power ratio, 20.0.

70,000 c.f.m. at A, equal splits at *B*; w.g., 1.33 in.; power ratio, 13.3.

77,000 c.f.m. at A, equal splits at *B*; w.g., 1.60 in.; power ratio, 17.6.

The 77,000 c.f.m. at 1.60 in. is to increase the air at the faces 10 percent without rebuilding stoppings. If leakage be reduced 25 percent between fan and splits by better stoppings, the additional air will be supplied to the faces without more air at the fan. The pressure will be increased to about 1.5 in. w.g., and the power ratio to 15.0, so that power is saved by reducing leakage instead of increasing fan output. It usually will pay to reduce leakage rather than increase fan air.

In Figs. 1 and 2, Points *C* and *E* need not be the last crosscuts in these entries. If the faces were 1,000 ft. ahead, the calculations would be the same for volumes at *C* and *E*, provided resistance is not increased by extending the faces; there are no changes ahead of *C* and *E* except those due to the air volume at *B*; and that the pressure at *B* was for the full split, including the parts ahead of *C* and *E*. Extending the faces increases gradually the pressure at *B* and at the fan at *A*.

In practice, the volume of air at the fan would increase when the pressure is decreased and adjustments would have to be made to maintain a given volume. Consequently, there probably would be some variation in fan efficiency.

In Fig. 3, with a continuous current through *ABCDEFG*, 1½ in. w.g. is assumed as the pressure required to move the air through sections *BCD* and *DEF*, with ½ in. for *ABFG*. Therefore, the total pressure at *A* is 3½ in. w.g. By splitting the air current, as in Fig. 4, and increasing the number of airways (or their cross-sections) for Section *ABFG* so that it will carry double the volume of air at the same pressure, twice as much air could be put into the mine at a 2-in. w.g. as with a continuous current and a 3½-in. pressure. The power ratio for the continuous current would be 35, and with the split current and twice as much air it would be 40. Assuming the same fan and motor efficiency for the increased volume following splitting, there still would be 100 percent more air with the split currents than with the continuous current, with only 14.3 percent more power.

Secondary Splitting

In Fig. 5, there is a high-pressure split to the right of the overcast *D*, and it is desired to calculate a secondary split. Let us assume, therefore, that 30,000 c.f.m. at *D* is split in two equal quantities just inside the overcast, the first split ventilating the next three room entries and the second passing under the overcast at *K* and ventilating all the workings ahead. If there is no leakage between *D* and *K* and each split requires a pressure of 0.5 in. w.g., while the 30,000 c.f.m. from the two splits requires 0.4 in. to deliver it from *K* to *D'*, the total pressure necessary to carry the air from *D* through the two circuits and then to *D'* will be 0.5 plus 0.4, or 0.9 in. total w.g. If the 15,000 c.f.m. ahead of *K* took 0.4 in. a continuous current with 30,000 c.f.m. at *D* and *K* would require 2.0 plus 1.6 plus 0.4, or a total pressure of 4.0 in. w.g. One-fourth as much, or 1 in., would be required for 15,000 c.f.m. at *D* and *K*.

The power ratio for 30,000 c.f.m. at 0.9 in. w.g. is 27, and for 15,000 c.f.m. at 1 in. is 15, so that 80 percent more power would provide a separate current of 15,000 c.f.m. for each of the two splits instead of 15,000 c.f.m. in a continuous current. In other words, twice as much air with only an 80 percent increase in power would be obtained by changing from a continuous to a split current. To get twice as much air by increasing the volume at *D* would increase the power eight times. In practice, there probably would be some leakage between the two splits from *D* to *K* and also between intake and return, *D* to *K*.

Leakage Considerations

To investigate a case with leakage, such as is found in many mines, a continuous air current might be assumed with 30,000 c.f.m. at *D* reduced to 15,000 c.f.m. at *K* by leakage, using the previous data as a basis for pressure. The average of the volumes at *D* and *K* will be taken as the mean of the volumes between these points, which will provide fairly average results without the necessity of additional quantity and pressure readings in the mine. The mean is 22,500 c.f.m. and the pressure for this section is obtained by solving for X in the equation 15,000 squared is to 22,500 squared as ½ in. is to X. X equals 1.125 in. w.g. The pressure for the return from *K* to *D* is 0.225 in. (X in the equation 30,000 squared is to 22,500 squared as 0.4 in. is to X). The pressure for the 15,000 c.f.m. circulated ahead of *K* was assumed to be 0.4 in., and the total pressure would be 1.125 plus 0.4 plus 0.225, or 1.75 in. for the continuous current with leakage.

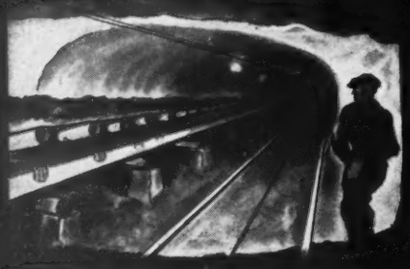
With the new workings between *D* and *K* not more than two crosscuts would be needed between the intake and return airways, and with good stoppings the leakage should be practically eliminated. The check in the mains will provide sufficient air temporarily for ventilating the haulway.

For the same volume of air, the power required will vary directly as the pressure, and for the problems based on Fig. 5 we have the following:

30,000 c.f.m. at *D* and *K* continuous current, 4.0-in. w.g.

30,000 c.f.m. at *D*, reduced by leakage to 15,000 c.f.m. at *K*, continuous current, 1.75-in. w.g.

30,000 c.f.m. at *D*, two equal splits, 0.9-in. w.g.



THE FOREMEN'S FORUM

How Can Mine Foremen Improve Quality and Dependability of Their Mine Output?

TO IMPROVE the quality of coal, foremen can do much more than enforce proper face preparation, though most foremen believe that their opportunity is thus circumscribed. It is true that to perform their work of improving the quality, a foreman needs and should seek the assistance of the company. For, to that end, many facts should be ascertained and facilities afforded that are not always available to him.

Variance in Coal Quality—It must be recalled that the quality of coal varies in the different sections of a mine, that the several benches or layers in a coal bed also vary in quality, and that the various beds being mined may also vary. With regard to the variance of coal in different parts of the same mine, it may be decided that it is best not to try to disturb, for the present, sections or beds of a quality inferior to that of the best coal which the mine produces, trusting that the idle sections or beds may be worked whenever the market either becomes disposed, by the closing of better mines or a change in freight rates, to accept less desirable coal or has learned how to handle it.

It is conceivable that it might later be able to burn such coal better than the coal which it now favors because the defects might be offset by a change in equipment—a slag-tap furnace perhaps or one that breaks up clinker. The market also might change, and coal formerly sold for making gas may find an opening for sale in industrial furnaces which are not so finical about sulphur percentages. But, in general, the leaving of coal in the ground is a questionable practice and likely to be regretted. Decision as to this is a matter for the higher officials, but the foreman might explain how a suitable product could be made without such sacrifices.

Making a Uniform Product by Mixing—A better way frequently is to mine all the coal, make a uniform product and sell this coal to the type of purchaser that can use such a product satisfactorily. To get that uniformity is a function of the mine foreman, using facilities provided by the company. If the quality of the coal, for example, is known for each section of the mine, the foreman can arrange to mix or blend the coal by: (1) operating the several sections of the mine as actively as will give the required blend and (2) by providing that the products of these several sections shall be properly mixed by dumping the cars in such sequence that the product of each three or four cars shall give the required analysis when mixed in the process of sizing, cleaning and loading.

This may require the provision of additional switching room and storage bins. In some few mines, mixing bins are provided or coal is mixed by filling cars in layers, but these are costly expedients. The better plan, where this expense does not appear to be justified, is to instruct the dumper or the bottom cager to follow certain sequences in dumping or caging, respectively, that will insure such mixing.

It generally is recognized that the industrialist is at least as much interested in uniformity as in quality. If his power-plant engineer knows what he is going to get, he will find some way to make steam with it, but if sometimes the coal is good and sometimes bad, he not only cannot handle the fuel to advantage but he is psychologically in a frame of mind that unfits him for handling it. Such coal cannot be marketed. Uniformity is essential for success in operation unless two kinds of coal are being put on the market.

How Some Mines Meet This Problem—One mine, for instance, has a very clean streak of coal where the undercut is made and this it keeps separate from the rest of the day's production, which is not difficult because it is so evidently bug dust and because it comes from the mine at a different time from that in which the rest of the coal is produced. Another company ships its morning's product to the coke ovens and its afternoon product goes to the railroad, as the railroad is not so finical as to sulphur as the blast-furnace man. In many cases, however, the cutting layer is none too clean and the reverse treatment is desirable. The foreman finding complaints being made about the coal he is delivering might well make these suggestions.

Differences in quality of beds may dictate the closing of operations in one or more of them. Generally, in the bituminous mines of United States, only one seam is worked, but in Europe and in our anthracite region, the rule is to mine all the seams that can be produced with profit at the time of operation, and it is better to mine all the seams concurrently, if possible, because of the losses in coal and the increase in hazard and cost whenever such a plan is not followed.

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Use of Dry Ice to Prevent Mine Fire Revivification

Though mine fires may smolder and die for lack of oxygen, they still may retain enough heat that they will revive on the advent of fresher air. Consequently, the extinguished embers must be sufficiently cooled that when air is admitted, spontaneous rekindling will not occur. But these embers will be cooled only slowly behind seals if the latter are tight. Recirculation of the vitiated air within the fire area apparently solved the problem at Sunnyside, Utah, in a fire that occurred many years ago, but with dry ice introduced behind the seals, the temperature should be far more greatly and rapidly reduced, and the revival of the fire made entirely unlikely.

Compressed carbon-dioxide gas in escaping from a manifold also creates a low temperature, but unfortunately the gas freezes and blocks the manifold's small exits. To avoid this, the manifold must be heated, which probably will cause the carbon dioxide to be delivered at a temperature too high to have much cooling effect on the fire or may even make that heavy gas so light that it will be unable to resist the action of drafts which, accordingly, may carry it away as fast as liberated. With dry ice, however, the gas is extremely cold and will blanket the area into which that heavy gas may flow.

The technique of placing the ice blocks where they will do most good is one that demands careful consideration. It is useless to put them too far below the fire or even above the fire, if the gas can pass alongside it without making contact with it. Perhaps the ice should be placed above the expiring fire, and a tight brattice erected below it, so as to hold the gas in place.

Information from the Lummus Co., dry-ice manufacturers, shows that a 10x10x10-in. cake of dry ice evaporated to gas at 55 deg. F. will occupy 537 cu.ft. Hence a cubic foot of ice will occupy at that temperature 928 cu.ft., almost 1,000 times

its original bulk. Under natural conditions, the cooling of the fire causes a shrinkage of the atmosphere around the sealed area through pillar and stopping leaks. If dry ice is added, the cooling of the fire is accompanied by expansion of carbon dioxide, and the result is not only an application of inert gas but the creation of a pressure which will maintain such pressure, below or above atmospheric, as exists behind the seals or will even create such a pressure as will cause some of the air in the sealed chamber to be forced out through cracks in pillars and stoppings.

This correction of the air contraction within the seals perhaps is more important than the actual cooling of the fire. The addition of inert gas by the dry ice may be needed only to correct that contraction, for in many instances enough inert gas is present to subdue the fire if only the cooling would not introduce enough oxygen to revivify it. Dry ice therefore provides for cooling, exclusion of oxygen and addition of inert gas. It seems, therefore, to have a place in fire fighting, provided that the fire area is not insufficiently sealed, or that, in placing the dry ice, too much oxygen is not introduced.

It must be remembered that the dry ice must be delivered through an airlock by men in breathing apparatus and must be handled with extreme care because of its extremely low temperature.

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Rockmen, Can You Beat This? Records of Two Tunnels

In driving the 9x10 ft. Carlton rock tunnel in the Cripple Creek region of Colorado, the following speeds were made in rock:

Section	Working Days	Advance per Day, Ft.
First mile.....	121	43.64
Second mile.....	109	48.44
Third mile.....	96	55.00
Fourth mile.....	94	56.16
Fifth mile.....	94	56.16
Sixth mile (water).	153	34.51

The Continental Divide Tunnel, a water project in rock being driven 13.06 miles through the Rocky Mountains, is of 9 ft. 9 in. diameter, but the section being driven is 12x12 ft. to leave room for steel horseshoe and concrete support. It has a record of 1,879 ft. driven in one 31-day period, or 60.6 ft. per day. The average for two years less three days was 47.24 ft. per day. In a 24-hour period an advance of 78 ft. has been made, and in 8 hours an advance of 27 (3.38 ft. per hour). One crew of three men in 31 days contributed 647 ft. to the advance made. The Elton Tunnel at Toole, Utah, when in solid rock averaged 35 ft. per day and measured 12 ft. high by 11 wide.

Of course, these records were made in tunnels where the tunnel advance was the sole consideration, but it would be interesting to back these records against those in the coal industry. In the Illinois No. 6 bed, an entry 6 ft. 2 in. high and 11 ft. 4 in. wide has been driven with McKinlay loaders a distance of 195.5 ft. in 30 hours of consumed working time (6.51 ft. per hour); but this work, of course, was in coal.

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Entering Air Carries Into Mines Dust From Tipple Dumps

For several hundred feet on either side of a tipple usually may be noted a deposit of coal dust derived from the coal dumps and screens. Particularly may this occur with pneumatic cleaning if the collection of dust is imperfect. If the dust can travel so far in that direction, it equally can be carried by the air of the intake into the mine headings where conditions are favorable for its further transference. Especially is there a danger of this where pneumatic separation methods are used for the cleaning of coal. Dust is carried all over the mining village; why not also underground? Yet, apparently, it is never given a thought in the location of mine drifts or of air shafts or in the operation of these thereafter. At hoisting shafts, however, attention is more often directed to this danger, for the dumping may be close to the intake of the mine.

Dust may be carried also from piles of fine coal or from the already described deposits of dust on the surface. Rock-dusting is expensive, and it is better to handle surface dust on the top of the ground than to take it into the mine for treatment. In some cases, also, dust in the air of the mine may be taken back to the workings by recirculated air. Much has been said of air recirculation, but recirculation of mine dust is equally to be apprehended, though some mines receive a large quantity of highroad and other dust that in a measure immunize the coal dust. When one recalls the dense dust clouds of the dust-bowl regions, one can readily conceive of the possibilities inherent in piles of non-coherent dust near a mine portal.

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"There Ought to be a Law"

Querulously, when accidents occur or the record of accidents is scanned, safety men and managers say, "There ought to be a law," or "We will establish a rule," without querying first whether there is not some way of making an accident impossible or of rendering unattractive the offense against safety that was the cause of the accident. Men usually are moved to act wrongly by a wrong condition or an undesirable incentive and, though the accident is the result of carelessness, forgetfulness, inattention, ignorance, recklessness or even malice, it always is well to explore a route to prevention that will not involve a rule, yet one that will make the accident improbable, almost impossible.

A rule or a law may be desirable, but avoid the idea that the passing of the law or the promulgation of the rule solves the problem. It almost never does so. Make the way of the transgressor hard by making it circuitous and difficult of travel so that no man in his right mind will travel it. That cannot always be done, but, where it can be, no mental aberration or human defect will cause an accident that will destroy life, ruin a record or upset the balance sheet by a needless charge for compensation. Make the right way easy or the wrong way difficult or impossible, and perhaps rules and laws may be made unnecessary or redundant, so that accident, fatality and regret may be avoided.

Given a good intention, one's own faults are easier to correct than those of the many other persons who may be affected, so look first for errors in construction and planning and later give consideration to a correction of the errors of the multitude. Safety men and managers also can bring technicians into line with less work and more effect than they can the non-technical men who are less disposed to submit to instruction, example and leadership. In most cases, technicians already are seeking for guidance in solving their problems and want to get other ideas from books or contacts to supplement their own. Also, a change in construction or arrangement is something definite and physical. Whether the change has been made is indisputably evident but whether a change in behavior permanently has been effected is not subject to accurate determination. Hence, a physical change can be better checked than one that is mental or moral.

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Major Mine Fires Avoided By Adequate Equipment

Whether anthracite is capable of spontaneous combustion is not clear, but what is obvious is that it all too frequently is ignited, with costly results. It has a high ignition temperature, but, once that is attained, the chimney effect it creates in heavily pitching beds makes progress of the fire rapid. With a level mine, or with a mine laid out with descending currents, a fire tends to choke itself.

For this reason, in anthracite mines where the beds pitch, road supports where dry should be made fire resisting as far as possible, and means should be provided of fighting fire, both at its start and until it is entirely subdued. Such means are soda-acid tanks, water, rock dust, gas masks, oxygen breathing apparatus and monoxide indicators. Locations and dates of charging of soda-acid tanks should be posted at several suitable points.

Anthracite fires are slow to start but quick to spring into effective action, and a few dollars of prevention may effect thousands of dollars of cure. How to fight fire is not nearly so important as how to prevent it from starting and from being fanned into a blaze.

STATE-BOARD QUESTIONS

Queries Posed Candidates for First Class Mine Foremen's Certificates in Kentucky*

Restarting Machine

In a place reported unsafe, what must be done before a cutting machine is started?

The power shall be connected....( )
The place shall first be pronounced safe .....(X)
The place shall be retimbered....( )
Ventilation shall be restored.....( )

[Sec. 35 declares that if in a working place the flame of a safety lamp or the equipment used for the detection of firedamp gives evidence of the presence of such gas, no machine shall be operated until the mine foreman or fireboss or a person duly authorized by either has examined the place and pronounced it safe. Of course, ventilation should be provided or restored, but that might even increase the danger, if the ventilation came from a working place with an excessive quantity of methane. So, the requirement is that test shall be made for methane and the cutting machine not started until the place is pronounced safe.]

When Miner Must Quit Work

When is a miner prohibited from working in his place?

When more than 1 percent of methane is present.....(X)
Before the section boss has made an inspection .....(X)
When there is water in the place..( )
Before the place has been made safe .....(X)

[Nothing in the law appears to state that a man may not work where there is more than 1 percent of methane in a working place, but only when that percentage or more of methane is present can the cap on a safety-lamp flame be observed. Sec. 36 requires that the fireboss shall make an examination using no light other than that inclosed in an approved safety lamp and that he shall place a danger signal across the entrance to every working place and every other place where explosive gas is discovered or where immediate danger is found to exist from any other cause, and said signal shall be sufficient warning for persons not to enter. Hence, it may be inferred that if 1 percent of methane is present, a miner should be prohibited from working.

[Sec. 42 requires that every miner shall thoroughly examine the roof and general conditions of his working place before commencing work thereon and during the progress of his work, and if he finds loose rock, slate or other dangerous conditions which he can remedy he shall take down such loose rock or slate or securely prop same and otherwise make his place safe before doing any work thereon. Provided, however, that where the operator elects to do the timbering it shall be the duty of the miner to forsake his working place until the place has been made safe. In the act, the duties of the miner are rather assumed than set forth directly, as they should be.

[There is no prohibition against working in a wet place, the act requiring only that the mine foreman shall see that the water is drained so near as practicable out of the working places and that the working places are kept as free of water as practicable during working hours. Sec. 40.]

Irremediable Dangers

In case it is impractical to remove a danger, what is the mine foreman required to do?

He shall notify the district mine inspector .....( )
He shall notify every person where safety is threatened.....(X)
He shall provide the men with respiratory apparatus .....( )
He shall close down the mine....( )

[Sec. 40 provides that the mine foreman shall give prompt attention to the removal of all dangers reported to him by his assistants, the fireboss or any other persons working in the mine, and in case it is impracticable to remove the danger at once, he shall notify every person whose safety is menaced thereby to remain away from the portion where the dangerous condition exists. . . . The mine foreman shall notify in writing the operator or superintendent of the mine of his inability to comply with any of the requirements of these sections.]

* Continued from December, 1942, *Coal Age*, p. 99.

Queries Posed Candidates for First Class Mine Foremen in Virginia*

What is the most reliable drainage system?

Pump .....( )
Siphon .....( )
Ditch .....(X)
Bailing .....( )

[One cannot definitely declare any one system to be really reliable. The only unquestionable statement would be that the siphon is most unreliable of all four. A siphon that will run for 36 hours is giving almost maximum service, and restarting is frequently a time-consuming process. However, with a pump to set it in operation, a siphon can be made to give almost trouble-free service. Ditches sometimes give a minimum of trouble, but, if they are deep, they may be almost destroyed by heaving of the mine bottom and by the raveling of the sides, and it may be difficult to find place for the material that, in time, will have to be removed from the bottom of the ditch. Bailing depends on the human element and is unreliable and costly.]

What may be the effect of undrained bodies of water on ventilation?

Aircourse may be blocked.....(X)
Mine temperature may be lowered .....( )
Dust hazard may be reduced..( )

[Undrained bodies of water may have all three effects. The water may rise to the roof in places and entirely block the air or it may merely reduce the cross section available for its passage. When the air comes from the surface, the water may either cool or heat it, depending on the time of year, and, if the air comes from the interior, it may have the same effect, depending on the part

Water frequently rises to roof, blocking off air.

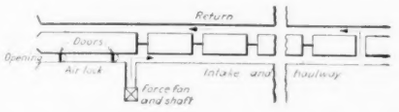
* Continued from November, 1942, *Coal Age*, p. 75.

of the mine from which it comes and the temperature at which the water enters the mine. It will reduce the dust hazard, though explosions underground have been known to extend long distances over standing water.]

How can the main haulway of a mine be placed on fresh air when the mine is ventilated by a force system?

By removing the overcasts....( )
It cannot be done.....( )
By installing one overcast.....( )
By use of air locks or by placing it on a separate split.....(X)

[If an air lock is placed at the mouth of the mine, the intake air can be forced into the mine inby the airlock and caused to return to and leave by another opening. The objection is that the air lock interferes with, and delays, haulage and that the highest pressure in the mine is near the air lock, which, at best, is leaky, having tracks and doors past which air tends to flow even when the doors are closed "tight."]



Air lock makes it possible to use force fan and yet haul on intake

Where possible and economical, trap doors should be replaced by:

Overcasts .....(X)
Stoppings .....( )
Checks .....( )
Line brattice .....( )

What is the maximum quantity of air required for each person in a gassy mine?

One hundred cubic feet.....( )
One hundred and fifty cubic feet (X)
Two hundred cubic feet.....( )
Two hundred and fifty cubic feet ( )

[See Sec. 1853, Law effective July 1, 1940.]

What is "short-circuiting" of air?

Conducting it across the working faces .....( )
Conducting it through doors to ventilate the main haulways.( )
Providing a bypass to conduct it around the fan.....( )
Permitting it to enter the return before reaching the face.....(X)

What is probably the greatest cause of most ventilation inefficiency in coal mines?

Leaky stoppings .....(X)
Inefficient fans .....( )
Sharp turns in airways.....( )
Long air travel.....( )

In a poorly operated mine, leaky stoppings are the greatest cause for ventilation inefficiency. In some well-conducted mines, the main trouble is in long air travel and the high air pressure needed, that in turn makes for leaks in stoppings. Fan inefficiency often is not the fault of the fan but of the failure of the fan to fit the needs and capabilities of the mine. A fan that may be well fitted to a mine when installed may be ill-suited after some years of mine extension, but modern fans are adapted to a somewhat wider range of service.]

How do overcasts aid ventilation?

By reducing mine resistance..( )
By making possible a larger volume of air.....( )
By permitting frequent splitting and uninterrupted ventilation (X)
By reducing leakage ..... ( )

[All the answers are partly correct. If the air is not split, all the air has to go to every section of mine, so the resistance is increased because the air has to be made to travel faster and to go a long way or it could not supply the air to every section. For this reason, with a split, a larger volume of air can be provided, using only the same air pressure. Leakage will be reduced, for it will be possible to use a lower water gage, but the principal advantage is that frequent splitting is possible with overcasts (and thereby the other advantages listed are or can be obtained) and that ventilation is uninterrupted because no doors have to be opened.]

How much pressure does 1-in. water gage indicate?

5.2 lb. per square foot.....(X)
6.5 lb. per square foot.....( )
4.3 lb. per square foot.....( )
3.9 lb. per square foot.....( )

Quiz Presented Applicants for Certificate As Mine Foremen in State of Alabama*

Overcast Requirements

Q.—(a) Draw a sketch of an overcast. (b) State some of the common errors made in constructing overcasts. (c) How do overcasts aid haulage? (d) How do they aid ventilation? (e) What should be the minimum areas passing over and through overcasts?

A.—(a) See illustration. (b) In most mines, overcasts are constructed of wood even where stoppings are of more permanent material. Yet an overcast usually is traveled over occasionally, and so the seams are caused to leak. The sides of the overcast stand near the road and are subject, therefore, to violent misuse, whereas a stopping is set back in a crosscut where it is protected. Overcasts deflect the air current from coal seam to roof and from roof back to coal seam and thus cause much resistance. This change should be well streamlined, and consideration should be given to this digression in planning the cross-sectional area.

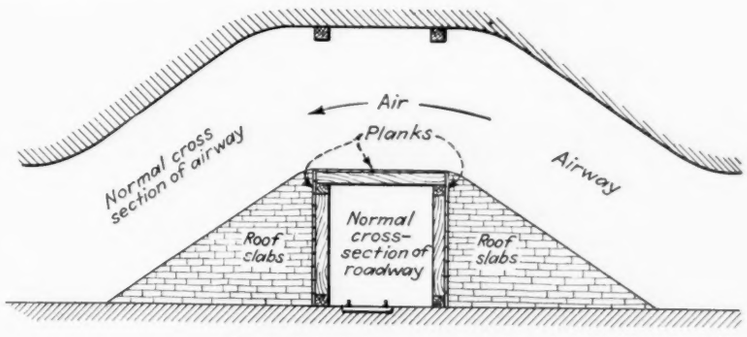
The air should have more traveling space on the slopes and top of an overcast than elsewhere. Too many advocate economy at this point as the distance of the construction is short. Overcasts should afford a roadway and airway of at least standard dimensions, with smooth walls and easy ramps. Preferably, they should be built of concrete.

(c) Overcasts aid haulage by eliminating doors that interfere with the passage of trips, enabling cars to travel with reasonably slackened speed around curves. By not making it unnecessary to interpose doors on the haulageway, they give the motorman and pedestrians a better opportunity to see what is ahead of them. Every door is a potential hazard, a death trap.

(d) Overcasts aid ventilation (1) because they eliminate doors which may be left open or latched back and which at best must be opened for the passage of trips; (2) because they are less subject to injury and accident than doors and so perform their ventilation function with more efficiency and reliability; (3) because they leak less than doors, and (4) because they make it possible to split the air current.

(e) As stated, the minimum cross-sectional areas should be at least equal to that of the airway and roadway respectively and the "airway" of the overcast should have larger dimensions if by going to the roof and in building the ramp the rock is so rough that resistance to the air is increased.

* Continued from December, 1942, *Coal Age*, p. 98.



Cross section of wood overcast

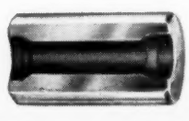
CINCINNATI CHAINS AND BITS OUTLAST THEM ALL

THE FAMOUS LONG-LIFE DUPLEX CHAIN AND DOUBLE-ENDED REVERSIBLE BIT

FOR years Cincinnati Cutter Chains, reversible double ended Bits and Cutter Bars have been saving mine operators many a dollar. In fact, some say average savings of $10,000.00 a year. The big economies effected can be attributed to engineering and design plus our knowledge of metallurgy. All Cincinnati equipment is made of high grade alloy steel . . . drop forged and heat treated in our modern heat treating plant. Let us prove to you that Cincinnati Chains, Bits and Bars will cut your per ton cutting costs . . . increase your production . . . lower maintenance overhead . . . and save power. Write today!

Replaceable long-lived, hardened alloy steel Connector Insert that gives new factory joint accuracy to a worn connector.

Hardened Eccentric Pin is designed so it can't turn in block . . . placing joint wear between pin and insert.



Alloy Steel heat-treated Rivet that holds bearing pin against longitudinal displacement. Easily removed.

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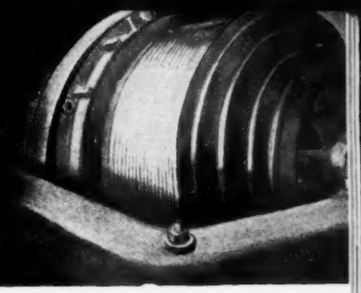
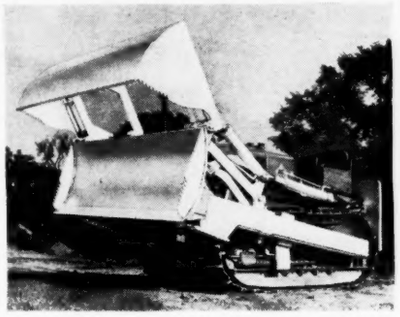
TIPS FROM MANUFACTURERS



Bulldozer-Clam

An all-around utility machine, the Drott "Bull-Clam" shovel, which is said to handle most shovel jobs, do everything a bulldozer will do, as well as all scraper operations, plus the work of many other units, is offered by the Hi-Way Service Corp., Milwaukee, Wis. Hydraulically controlled from the driver's seat, it digs, carries or floats material, dumps it—cuts smoothly and spreads evenly. Depth of the cut is regulated by raising and lowering of the clam. By moving forward, the dirt "boils" into the shovel, leaving a level footing for the tractor at all times. Either end of the clam may be tilted independently to a 24-in. angle from the driver's seat while the tractor is in motion.



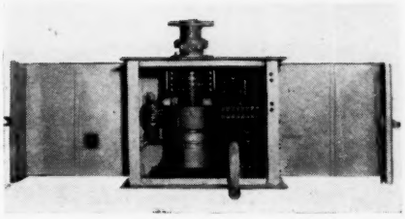
By keeping the clam wide open, the outfit may be used as a bulldozer without obstructing the view of the operator. Available in various sizes, the Bull-Clams are made to fit all makes and models of tractors and have heaped capacity ranges of 1 to 4 cu.yd. Their lifting capacities are 3,000 to 12,000 lb. Objects or material may be carried as high as 3 ft. above ground. The drop below ground level is 1 ft.

•

Circuit Controls

Southern States Equipment Corp., Birmingham, Ala., offers Type MF-1 dropout fuses with double snubber which acts as a friction brake and brings the cartridge to a smooth, cushioned stop at the end of the opening swing. This snubber is said to be fully adjustable and easy to adjust in the field; no special tools being required. Terminals are furnished for cable or tubing, as specified.

Type H-33A dropout cutouts, says the company, are similar in design, construction and operation to its Type 33 but have been "sealed up" sufficiently to give full protection in the face of heavy fault currents.



Type PG disconnect switches, also offered by S.S., are said to carry their full rated load continuously with temperature rise not exceeding 30 deg. C. above ambient temperature of 40 deg. C., in accordance with N.E.M.A. standards. Clamp-type terminals are furnished; also cross-arm strap or mounting plate with two ¼x6-in. galvanized bolts.

Universal hot line clamps, announced by S.S., are recommended as having great mechanical strength and electrical conductivity.

Type TM-V MotoMeks are said to switch power automatically from a preferred to an emergency feeder when trouble or overload strikes. When voltage is restored on the preferred circuit, the MotoMeks automatically return the load to this source without momentary interruption. Designed for wall or pole mounting at any convenient height, the TM-V operates 5 seconds after the motor is energized; available for operation of switches up to 69 kv. inclusive.

Types RPT and RPTO automatic reclosing mechanisms, offered by S.S., are self-contained motor mechanisms for the operation of oil circuit breakers; they are substantially the same except that RPTO is arranged for outdoor mounting.

•

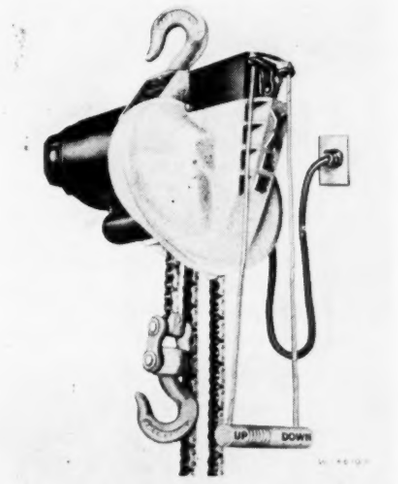
Anti-Fog for Goggle Lenses

To help keep safety goggle lenses from fogging, American Optical Co., Southbridge, Mass., announces a new type of anti-fog lens pencil. The new compound, according to thorough laboratory tests, is said to assure superior anti-fogging results for a longer period of time than former types, thereby adding to the efficiency of men working in steamy surroundings. In addition, the pencil itself lasts long without crystallizing and crumbling.

•

Electric Hoist

Yale & Towne Mfg. Co., Philadelphia Division, offers the Midget King electric hoist to lift ⅛-, ¼-, ½- and 1-ton loads. Made in both a.c. and d.c. models, it is said to be not only economical in operation but requires no extra equipment—



just a place to hang, an electric outlet to plug into. It can be carried to any place in the plant with very little effort. Yet, despite its lightness, it is tough, durable and sturdy in every mechanical feature. The most important feature, however, is its speedy, economical and efficient operation.

•

For Artificial Respiration

E. D. Bullard Co., San Francisco, Calif., offers the Rubber Lung, a device for administering artificial respiration. It is recommended to supplement and increase the effectiveness of Schaefer prone-pressure treatment to restore breathing suspended through shock, fumes and gases, drowning, etc.

The device is strapped to the back or stomach of the victim and adheres to the body through suction. Raising and lower-

ing the Lung handle at normal breathing rate is said to activate the muscles of the victim, causing them to draw in and exhale air. Differing from mechanical resuscitators, the Rubber Lung does not force air in and out of the lungs, but stimulates action of the normal body muscles, helping them to do the work required for breathing until they regain strength to do this work without assistance. Circulars describing this new device are available from the manufacturer.

•

Bulletin Display Cabinet

A new, modern bulletin display cabinet, known as the M.S.A. Toll-Board, is offered by Mine Safety Appliances Co., Pittsburgh, Pa. The unit is designed for better display of wartime safety and morale posters, instructions and special messages. Sturdily constructed of non-critical materials, the Toll-Board's glass-front cabinet permits quick change of bulletin material through a novel but thoroughly practical design.

The cabinet is illuminated, and equipped with simple, trouble-proof hardware designed to give years of efficient service. Change of bulletin material is easy, the manufacturer points out. A pivot joint at the top permits the cover to swing up and away from the back where it is retained in an open position by a hold-out latch so that the fiber posting board can be easily removed or replaced.

Tightly fitting seams make the Toll-Board's use in exposed locations practical. Attractively finished in two-tone green enamel, the unit measures 32 x 25 x 3½ in. and is equipped with a glass sign with sandblasted letters reading "Safety Bulletins" or "General Bulletins." Descriptive bulletin CD-10 may be obtained from the manufacturer.

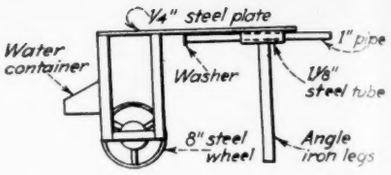
Compact Linestarter

Requiring less than half the mounting area of former units without sacrificing wiring space, and saving considerable critical materials, according to the manufacturer, a compact lightweight linestarter has been developed by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., which is under 10 in. high. E. G. Forgy shows the new space-saving unit to L. F. A. Mitchell, T. C. Kelley and R. W. Owens (left to right), all of East Pittsburgh. Although over-all dimensions are smaller compared with former unit (shown at right), all parts are accessible from the front for easy repair and maintenance.

•

Portable Welding Table Includes Water Box

Convenience is a major feature of the welding table shown in the accompanying illustration by John L. Sabies, Martins Ferry, Ohio, which appeared in a recent issue of *The Stabilizer*. "The all-welded steel water container shown in the drawing is for the quick cooling of hot pieces. As shown by the dotted lines on the 1 in. pipe, it may be pulled out when the table is to be moved and will serve as an excellent handle. This table can be easily made from scraps found around almost any shop. Consequently, its cost is practically nothing."



Welding table construction details.

Interlocking Circuits Permit Efficient Use Of Group Conveyor Systems

"WITH every operation in a mine being stepped up for higher production, it becomes more and more important to provide adequate circuits for the efficient control of groups of interlocking machinery and thus prevent work stoppages, injuries and damage to equipment," says a recent issue of *O-B-Haulage Ways*. "The control stations for these circuits should be centrally located so that no time is wasted walking to and from switches. Circuits should be arranged to prevent coal from piling up on an idle conveyor or one which is reversed to carry men and supplies back into the mine. Another valuable circuit is that which provides sequence control, preventing many heavy motors from starting at the same time and thus causing a momentary drain on the generating equipment.

"The simplest type of control circuit would be one which starts a single shaker conveyor feeding into a mine car (Fig. 1). In this case, two control switches, hooked up in series, would be necessary, one at the shaker drive and the other at the working face. With such a hook-up, both switches would have to be on to start the conveyor. This eliminates the danger to anyone at the face of having someone at the drive start the shaker.

"The next simplest circuit would be

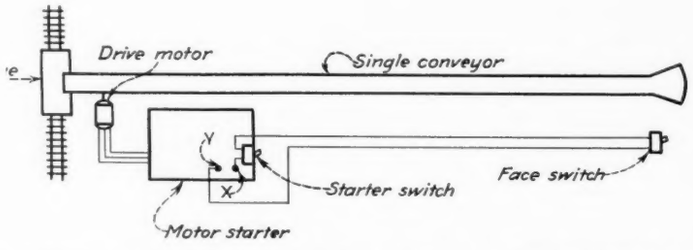


Fig. 1—Control circuit for starting a single shaker conveyor feeding into a mine car.

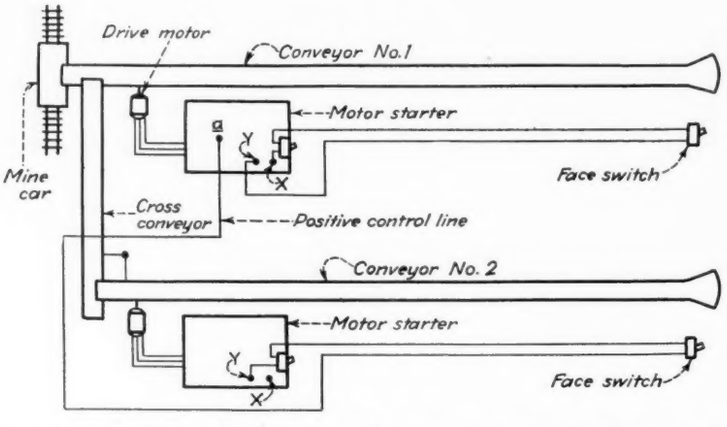


Fig. 2—Circuit for controlling two shaker conveyors, one feeding onto the other, which in turn loads into a mine car.

STEPPING STONES TO VICTORY!

EACH landing we make, each enemy position we capture is a stepping stone toward Victory. Each is part of a great chain, leading to Berlin, Rome, and Tokio. But remember, the men who tread this path need backing from all of us at home.

For example, strict conservation of batteries is vitally important . . . and the four simple rules for battery care may be compared to stepping stones. Follow them to make batteries last. Buy to last and save to win.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

FIRST STEPPING STONE—Keep adding approved water at regular intervals. Most kinds of local water are safe in an Exide Battery. Ask us if yours is safe.

SECOND STEPPING STONE—Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.

THIRD STEPPING STONE—Keep the battery fully charged—but avoid excessive overcharge. There's always a right way to do any job and a storage battery will last longer when charged at its proper voltage.

FOURTH STEPPING STONE—Keep records of water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Know what's happening!

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for Booklet Form 1982.

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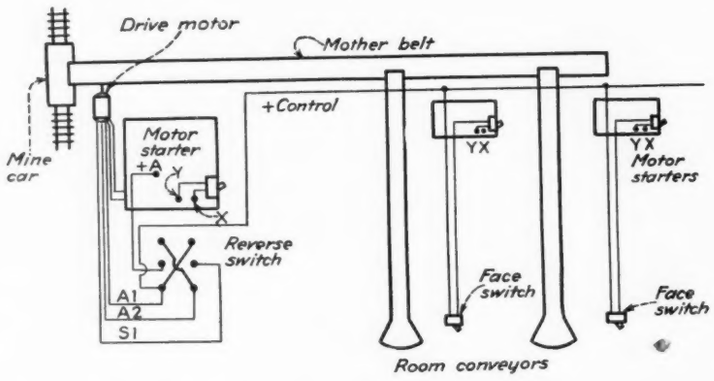


Fig. 3—Arrangement of control circuits for a battery of shakers feeding onto a mother belt.

one which controls two shakers, one with a right-angle drive loading onto the second shaker which in turn loads into a mine car (Fig. 2). Under such arrangement, Shaker No. 2 should not feed onto No. 1 while the latter is idle or a large pile of coal will be the result. A proper control circuit for this set-up would prohibit power to the motor starter on Shaker No. 2 while Shaker No. 1 is idle, and is accomplished by running a positive control line from Starter No. 1 to Starter No. 2. This line is connected into Starter No. 1 behind the line contactor and to Starter No. 2 through the face switch and starter switch to the Y post which is the contactor-coil circuit terminal.

"With Shaker No. 1 running, Shaker No. 2 can be controlled individually by either its switch at the drive or at the face, but both shakers are controlled simultaneously by No. 1 Shaker switches.

"One step farther gives us the situation where a battery of shakers is feeding onto a mother belt. Here the problem is not only stopping the shakers when the mother belt stops but also stopping the shakers when the mother belt is reversed to carry in equipment and men. Here again, a positive control line is run from the starter of the mother belt to the shaker drive, only this time it is connected to the A1 lead of the reversing switch on the belt starter. All the control circuits of the shakers are connected in parallel from the one positive control line (Fig. 3). This permits each shaker to operate individually when the mother belt is running forward, but stops all of them when the belt is stopped or reversed.

"Reversing the belt is accomplished by reversing the armature leads. With the belt running forward, the A1 lead is at positive potential and this operates the control coils of the shaker starters, but when the belt is reversed, A1 goes to ground and A2 is at line potential. Then the only voltage across the shaker coils is the drop across the series field of the belt motor, which isn't enough to operate the contactors of the shaker starters.

"This arrangement also gives sequence starting, which prevents all motors from starting at once. The contactor coils of the shaker motors are connected across the armature of the belt motor. Upon starting the belt the back voltage across the armature is low and as the motor speeds up the back voltage increases until it is almost at line voltage when the starting resistance is shorted out. It takes a short time for the voltage to build up high enough to operate the contactor coils of the shaker drives, causing them to start after the initial inrush to the belt motor is over."

First-Aid for Faithful Chain Drives; How to Keep Them Running

HOW TO KEEP chain drives running is the subject of Folder No. 1951, recently issued by the Link-Belt Co. Excerpts from this folder are as follows:

"*What to Do for Worn Chain*—Chains wear in two ways: (1) in the joints, from articulation under stress when flexing to pass onto the sprockets, and (2) on the outer surface of the barrel or in the rollers and bushings, from contact with the sprockets. While only joint wear affects pitch length of the chain, barrel or roller and bushing wear determines the radius at which the chain operates over the wheels and has a direct effect upon the pitch balance.

"*Turn Chains Over*—Turning a chain over so that the opposite side contacts the sprockets is a quick and easy means of restoring the original backing dimension on cast pintle chains . . . On roller chains of either cast or steel-fabricated types, this same simple operation will bring practically new surfaces into play under the rollers.

"*New Life From Old Chain Pins*—Correctly applied drives are selected with such an ample safety factor that even considerable wear on the pins does not weaken the chain beyond use. In designs where pins are locked against rotation, wear is confined to that side against which the next link is held under tension. Rotating these pins 180 deg. places articulation action upon a practically unused pin area and, as far as the pins are concerned, restores original pitch." On some classes of chains, "the pin heads must be renotched. Substitute replacement pins which do not lock against rotation should not be used, as they will soon wear through the eyes of the links.

"Bushed chains . . . afford another opportunity for pitch correction by reversing the bushings or rotating them 180 deg. This, however, involves the dismantling and reassembly of heavy press fits and should be avoided except as a last resort.

"*What to Do for Worn Wheels*—Sprocket-wheel wear, from impact or contact with the chain, can occur on the tooth or root-diameter surfaces, or both. Of the two, tooth wear is the less serious, provided it is fairly uniform, but root-diameter wear reduces the radius over which the chain operates and 'climbing' is the inevitable result.

"Cast-tooth sprockets, particularly in the larger diameters, frequently can be reversed on the shaft to bring chain barrels or rollers into contact with unworn root-diameter surfaces. This does not hold true for the smaller cast-tooth wheels nor for cut-tooth sprockets, but worn root-diameters on all types may be built up by welding and grinding smooth to fit the chain.

"Should wear have deformed the teeth of cast-tooth wheels into a hook shape which interferes with the chain entering or leaving the sprockets, these hooks may be ground off or the wheels reversed."

Seven servicing suggestions also are offered in Folder 1951, as follows:

"1. Keep shafts exactly parallel and wheels exactly in line. Misalignment causes uneven loading and unnecessary wear.

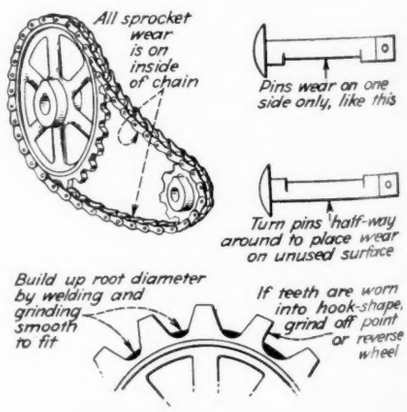
"2. Remove chain frequently and clean thoroughly in some solution to wash out harmful dirt and grit. Then immerse in oil.

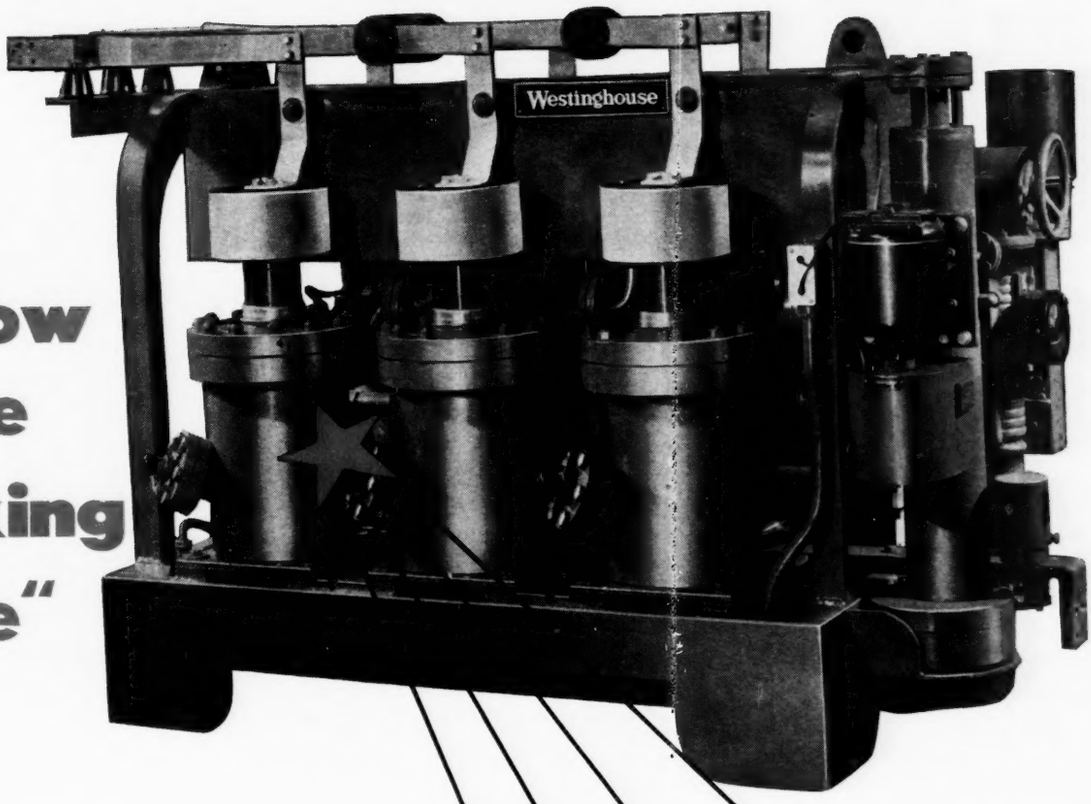
"3. Protect chain and wheels from needless exposure to abrasive materials, dust and dampness. Use oil-tight casings with high-speed silent or roller-chain drives.

"4. Inspect shaft bearings by removing grease from bearing ends to expose the actual bearing metal. Rebabbitt if needed.

"5. Flush ball or roller bearings periodically with fresh grease to drive out foreign matter and replenish the seals. In dusty atmospheres or dirty locations, use auxiliary dust seals.

"6. Check machinery supports for vibration and reinforce if necessary.





"follow the working face"

with new, high-overload capacity power conversion

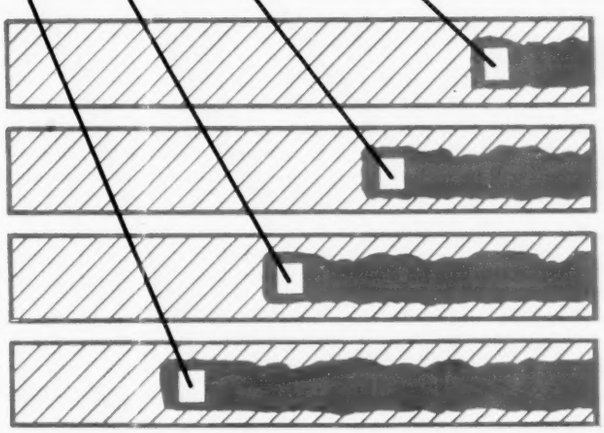
"Keep your substation near the working face." That's the word from the mining industry's top electrical engineers. By cutting distribution losses, you deliver full voltage to your working tools, make it practical to expand mechanized operations at remote levels.

The new Westinghouse IGNITRON RECTIFIER is ideal for underground service, because of the ease with which it can be periodically relocated. It is lighter, and requires less space than ordinary conversion equipment. Wheel-mounted, it becomes as mobile as the mine cars themselves, can pass through low and narrow passageways.

Whenever it becomes necessary, the entire substation can be moved and put back in service quickly. Length of feeders is held to a minimum. No special foundations or ventilating ducts are required. Just connect the control and power leads, and service is resumed. More important, short-time overloads — even short circuits — will not injure the Ignitron Rectifier. Breakers can be set to trip less often — production maintained more steadily.

For the complete story of the IGNITRON RECTIFIER'S many advantages, write for Booklet B-3024. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N.

J-10220



Fully unattended, automatic operation

No need to tie up operating or maintenance men where Ignitron Rectifiers are in action! Operation can be made completely automatic, permitting units to be operated in isolated locations.

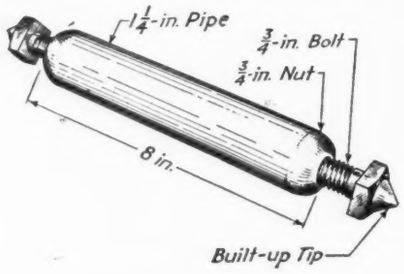
—Westinghouse—**Ignitron Rectifiers**—

"7. Operate chain with a little more slack than normal for a flat belt. Tight drives wear chain and sprockets needlessly."

•

Handy Welding Jack Fabricated From Pipe, Nuts and Bolts

"A handy jack for aligning and positioning parts to be welded can easily be fabricated by bronze-welding a ¾-in. nut, preferably a hex nut, into each end of an 8-in. length of 1¼-in. pipe," states a recent issue

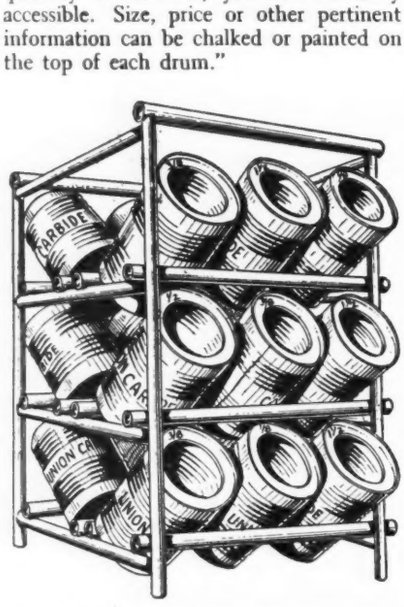


Jack construction details.

of Oxy-Acetylene Tips. "Screw a ¾-in. bolt 4 in. long into each nut as shown in the sketch. A boss built up on each bolt head and then ground to a point will prevent slipping or skidding while the jack is in use."

Carbide Drums and Rack Make Stock Bins

"When arranged on a rack as shown in the sketch, empty carbide drums make ideal bins for stocking bolts, nuts, nails, staples and other similar items," points out a recent issue of Oxy-Acetylene Tips. "The rack is fabricated with the welding blowpipe from old boiler tubes or scrap pipe. The four pipes forming the bottom of the shelves should be so spaced that the drums will be inclined at an angle of about 45 deg. Thus they will hold the greatest quantity of material, yet will be easily accessible. Size, price or other pertinent information can be chalked or painted on the top of each drum."



Stock bins from drums and scrap pipe.

Industrial Notes

METALLIZING CO. OF AMERICA, Chicago, has established a new engineering service program designed to assist industry on all problems relating to salvage, conservation of materials, and the use of substitute metals for the more critical ones.

NEW DEPARTURE Division of General Motors, Bristol and Meriden, Conn., received the Army-Navy "E" production award on Nov. 24.

CHAIN BELT CO., Milwaukee, Wis., has elected A. R. Abelt, secretary of the company, as a director to replace F. J. Weschler, of the Baldwin-Duckworth Division, who died in November. He also was elected a vice president. G. D. Gilbert, sales manager of the Baldwin-Duckworth Division, Springfield, Mass., has been made general manager of that division and also elected secretary of the company to succeed Mr. Abelt.

CONSOLIDATION of the Joshua Hendy Iron Works, San Francisco, Calif., and the Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., has been effected by the purchase of Crocker-Wheeler by the Hendy company. Hendy has been making heavy machinery for propulsion of Liberty ships while Crocker-Wheeler has been manufacturing electric motors, generators and flexible couplings. Crocker-Wheeler has appointed W. L. Buchanan as field manager of renewal parts sales, with headquarters in the Chicago office.

LINK-BELT CO., Chicago, announces that William C. Carter, for 14 years vice president and for the last year executive vice president, has been elected president, vice Alfred Kauffmann, who has resigned because of ill health. Mr. Carter, a mechanical engineering graduate of the University of Illinois, joined the Link-Belt Pershing Road Chicago plant in 1902 as a draftsman. Mr. Kauffmann, who has served the company for 41 years, remains a member of the board.

KANSAS ORDNANCE PLANT, Parsons, Kan., operated by J-M Service Corp., a Johns-Manville subsidiary, has received the Army-Navy "E" award.

HOWE SCALE CO., Rutland, Vt., announces that H. W. (Warren) Hem, a noted engineer in the field of weighing, has joined the company as research director.

AMERICAN OPTICAL CO., Southbridge, Mass., has received the Army-Navy "E" award for achievement in war production.

COOPER-BESSEMER CORP., Grove City, Pa., received the "M" award of the U. S. Maritime Commission on Dec. 18.

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Trade Literature

A. C. WELDERS—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Booklet B-3136 describes a complete line of Flexarc a.c. welders with current ratings from 100 to 500 amp. Featured are the 500-amp. industrial welder for high-speed continuous welding on all types of heavy construction and the 300-amp. portable unit for heavy-duty work. Both models have built-in power-factor correction.

ALLOY STEELS—Joseph T. Ryerson & Son, Inc., Chicago. Booklet deals with the selection and heat-treating of "National Emergency Steels." The Jominy end quench hardenability test, a quick method of determining the heat-treatment response, is explained step by step and a cut-away diagram shows the test in action.

BRAZER AND MARKER—Ideal Commutator Dresser Co., Sycamore, Ill. Folder points out the advantages and many uses of the Ideal electric brazer and the Thermo-Grip. Another folder describes the Ideal electric marker and Ideal etchers for a variety of uses.

CLOTHES LOCKERS AND SHELVING—Ivel Corp., New York City. Leaflets describe Victory wood clothes lockers and simplified (patented) wood shelving. The lockers are made of plywood or pressed wood, substantially framed and finished in olive-green eggshell enamel. Various sizes and combinations are available. The shelving is a brand new line based on a principle which permits the secure engagement of members without the use of any hardware.

DRIVE CONTROL—Westinghouse Electrical & Mfg. Co., East Pittsburgh, Pa. Booklet B-3123 describes the Rototrol, a versatile d.c. drive control, stating that it increases the speed range; keeps the speed of a direct-current motor constant regardless of load variations; makes accurate or very close speed regulation possible; gives uniform acceleration and deceleration; and maintains constant horsepower and uniform tension. Charts, diagrams and photographs explain how the Rototrol regulates by transposing mechanical and electrical quantities. Typical applications are described and illustrated.

ELECTRIC DRILL USE—Black & Decker Mfg. Co., Towson, Md. Handbook shows new workers, especially in war-industry plants, the correct methods of using portable electric drills and obtaining greatest efficiency and longest life from these important tools. Such points are covered as assembling the drill and maintenance and care.

HEATERS AND THAWERS—Hauck Mfg. Co., Brooklyn, N. Y. Bulletin 1038, entitled "Keep Ahead of Winter Troubles," describes concrete heaters, water heaters, salamanders and superheated steam thawers for heating and guarding against delays, tie-ups or shutdowns due to ice, snow or freezing weather.

PAINTS—S. C. Johnson & Co., Inc., Racine, Wis. Booklet describes wax-fortified paints, telling why they are wax-fortified, what makes them economical, and where they are used.

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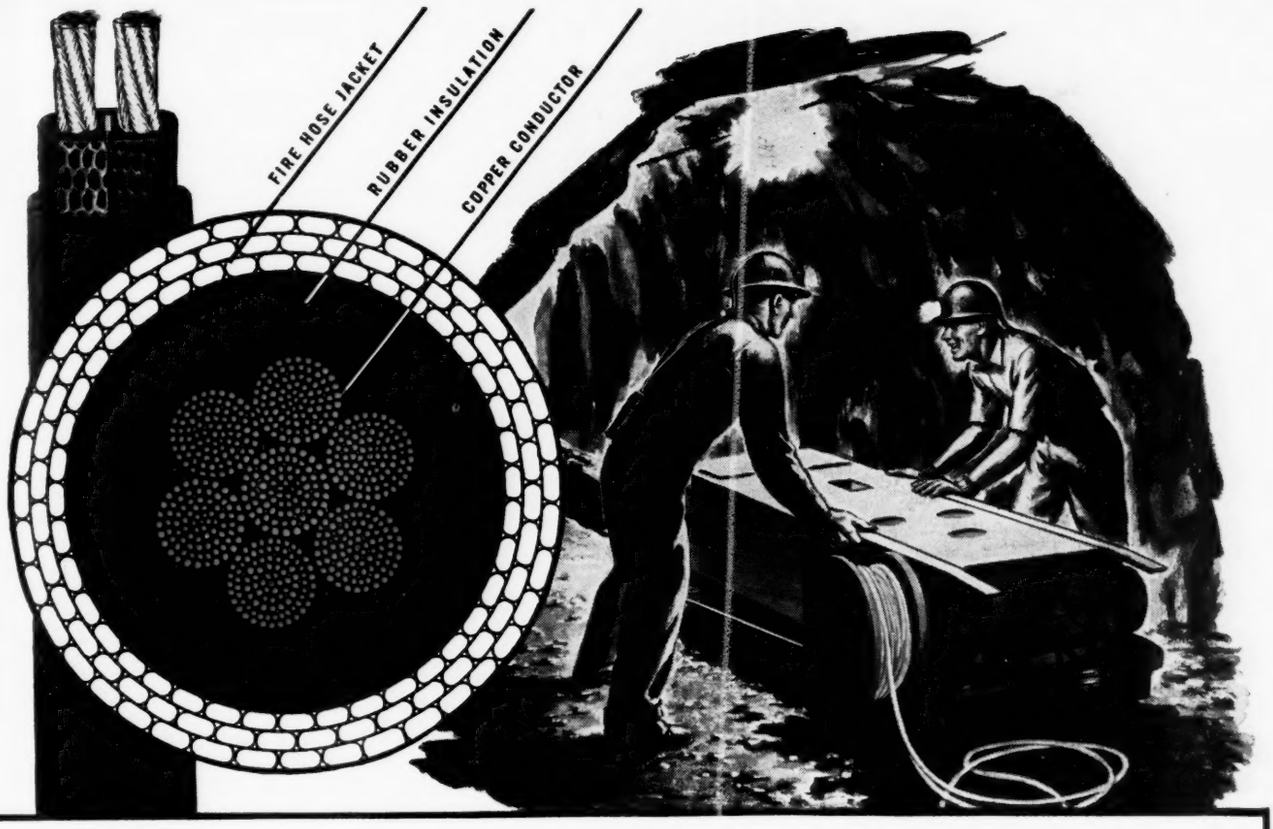
Rearranging Picture

The illustration on p. 100, col. 1, of our December issue, inadvertently was misplaced. It should have been in col. 3, first item, describing the M.S.A. Comfo respirator, of which it is a reproduction.



Duracord saves up to 50% rubber in portable cables...has a better than 20-year service record

THERE is nothing "ersatz" about Duracord*; it is a cable construction developed during the last war to meet the need for heavy-duty cords and cables . . . a need it is *currently* filling not only in mines but also industrial plants and shipyards.

The Duracord covering is woven like a fine hose—*not braided.* This tough yet flexible cover replaces the rubber jacket on all-rubber cords making possible rubber savings as high as 50%.

For further information, please send us your inquiries.

SUNEX SECURITYFLEX* TO WAR

This well-known all-rubber companion to Duracord has been preempted for the toughest kind of jobs in the war effort where all-rubber cord is mandatory. Until peace, its use will be strictly regulated. 42255

*Reg. U.S. Pat. Off.

Two marks of achievement – the cherished Navy "E" (awarded to two of our plants) for achievement in production...The Anaconda trade-mark for achievement in quality.

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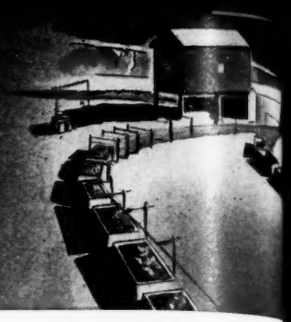
Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY

TIMELY OPERATING IDEAS



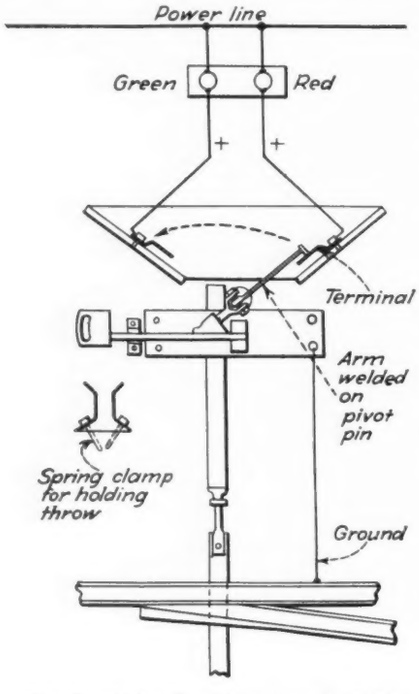
Safety Derail Includes Automatic Lights

To prevent cars which have broken loose from a trip from running back into the mine, the safety derail shown in the accompanying illustration has been made from a standard switch stand, reports Carl Donie, superintendent, Little Betty Mining Corp., Linton, Ind. It is fitted with automatic lights to show derail position.

With the regular derail, Mr. Donie points out, it must be thrown behind the motor trip, and then the trip has to stop on the return until the derail is thrown back. "With this set-up, by fastening a rope from the handle of the throw to the roof, the motorman can throw the derail without stopping. Therefore, it is not necessary to restart a loaded trip. Coming back, all the motorman has to do is slow down a little and throw the switch back over.

"The derail was made out of a parallel spring switch throw and a pair of switch points. It is necessary to turn the throw around so that the pulling lever will be on the back side of the stand instead of the front so an arm can be welded on the pivot pin. The turning of the pivot pin causes the arm to make contact with one or the other of two terminals that are connected to red and green lights. When the derail is open, the red light is on; when it is closed, the green light burns. The switch stand must be grounded to the rail and the terminal and light operating arm are covered to prevent anyone from coming in contact with 'hot' wires.

"We encountered some trouble with the throw lever bouncing back. This we eliminated by making a clamp with spring jaws that can be adjusted to any amount of grip by turning the lag screws that hold it to its wooden base. We have found this derail foolproof and very good from economical standpoints, since, as the derail generally is placed on a hill, it saves the necessity of starting a loaded trip on the grade, thus saving a lot of power and reducing heating up of the motors."



Details of derail with automatic lights.

•

Making Conveyor Belts Last Longer at Mines

"With the introduction of mechanical-mining equipment into the coal mines during the depression years, there is today hardly a mine, large or small, that doesn't employ some type of conveyor belt to move coal from one point to another," writes Charles E. Chandler, Brownsville, Pa. "The most common type of belt used around the coal mine is the rubber and canvas belt with plies of heavy canvas impregnated with rubber and having top and bottom covers of tough, resilient rubber. Rubber conveyor belts are expensive, and now that the rubber shortage is here and they are difficult to replace, it is the responsibility of every mechanic who has charge of conveyor belts to keep them in a good state of repair.

"To the average coal-mine mechanic, the repair of rubber belts is somewhat of a problem, and more often than not the belt is neglected because the person in charge did not fully understand how to repair it. If maximum service is to be expected from every rubber conveyor belt, then these belts must be repaired as soon as any defect is found, for a small gouge that penetrates the top or bottom cover and allows moisture to enter the carcass will be a major repair in several months' time. Most of the belts being manufactured today are treated with a mildew repellent, but belt technicians have advised that the treatment is not 100 percent effective. Therefore, it is up to the belt repairman to seal small cuts and gouges as soon as they appear in the cover.

"Every mine that has one or more rubber conveyor belts should have a small spot vulcanizer, as this is the only method of repair that will last the life of the belt. These small vulcanizers can now be purchased, but any mechanic that is handy with an acetylene torch and electric welder can make one in a short time, using a Calrod heating unit from an electric cooking stove.

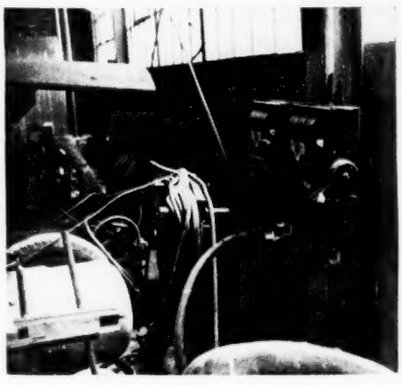
"If there isn't a vulcanizer available, then the next best repair is to clean and dry out the gouges and paint them with Vulcalox, putting on two or three coats and letting each coat dry before applying the next one. Vulcalox is a fast-drying rubber cement that is ideal for waterproofing fabric, but on the surface of a conveyor belt it does not last very long and will have to be renewed in several weeks. Vulcalox also can be used on the edges of belts where the cover has been worn off due to the belt not tracking properly and rubbing on the conveyor support piers. Apply the same as on a top cover gouge, first brushing thoroughly with a steel-wire brush, washing with tetrachloride or benzene and then applying the coats of cement.

"If the electric vulcanizer is used it will have to be done under pressure and the heat will have to be at least 280 deg. F. for 30 minutes to get the proper cure. If a little care is used with conveyor belts and they are repaired as soon as possible, many thousands of tons of carrying life will be added."

•

Welder Connections Changed Speedily and Safely

With several d.c. and a.c. welding machines of various capacities available at most large mines, speed and safety in shifting connections from one machine to another is a factor of value for convenience of the men and for quality of work done. The welding section in the new shop of the



Safety switches and plug connections for power supply to electric arc-welding sets.

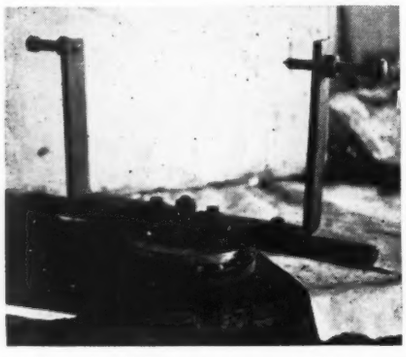
Sentry Coal Mining Co., Madisonville, Ky., is fitted with safety switches, to which are rigidly attached 3-wire receptacle connectors. The 3-point plug is attached to the cable which is permanently connected to the welding machine.

This arrangement enables the welder quickly to provide the characteristic arc that his immediate work requires, while avoiding all possibility of shock from power wires.

•

Armature Winding Made Easy By Special Holder

The quick reversal of a hand-wound d.c. armature, end for end, hastens and makes easier the job of wrapping the wire on the core. For this purpose, the electric shop of Consolidated Coal Co., Herrin, Ill., headed by Harry Becker, devised the freely manipulated holder for small armatures shown in the accompanying illustration. Holes in the base bar provide for shifting the vertical arms to accommodate various shaft lengths, while screw-mounted



This frame provides for free armature motion in two directions. Wires are more easily and exactly laid in place.

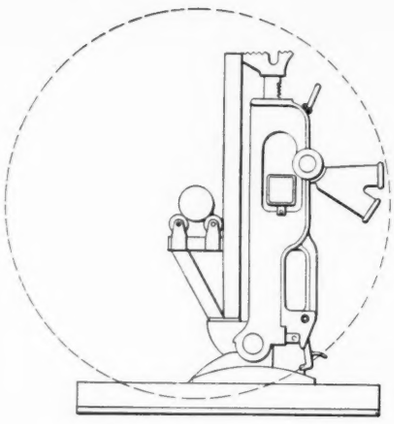
centers with locknuts take care of the micrometer adjustment. The frame is mounted on a discarded thrust ball bearing which forms the base and makes rotation of the frame a mere finger-touch effort.

•

Special Jacks Facilitate Reeling Wire and Rope

Spooling or reeling wire rope, trolley wire and cables can be a laborious job unless the proper equipment is at hand, writes P. C. Ziemke, Milwaukee, Wis., in describing special jacks to facilitate this work. "Time was when we used cumbersome wood blocking and an assortment of jacks to lift the reels clear of the floor and to place the horses or blocking under the shaft run through the reel. Having considerable work of this type to do around the plant these busy days, we developed a special pair of jacks to lift and support the reels during spooling operations.

"We got the idea from a line crew installing a new substation. They used specially constructed jacks built by Simplex, but we compromised by adapting two old track-maintenance jacks. Bars of



Details of reel-supporting jacks.

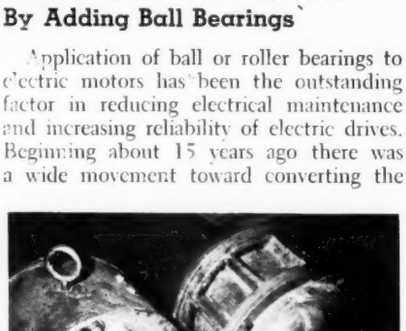
1¼x1¼-in. steel were welded to the toe lift and a bracket of the same steel was used to construct a support for the two rollers on which the reel shaft or axle turns. The rollers were fashioned from four worn ball bearings.

"The addition of the brackets to the jacks, of course, tended to change the center of gravity, and to offset this an extension 1 ft. long was welded to the bases. In use, the turning of the reel tends to cause it to move along the shaft, even though it is level. To overcome this tendency, it is recommended that movable collars with setscrews to lock them against the reel flange be used to keep the reel centered and turning free of interference with the jacks."

•

Stationary Motors Improved By Adding Ball Bearings

Application of ball or roller bearings to electric motors has been the outstanding factor in reducing electrical maintenance and increasing reliability of electric drives. Beginning about 15 years ago there was a wide movement toward converting the



Two motors modernized to meet the demands for lower maintenance cost and greater dependability.

armature bearings of old mine locomotives to anti-friction types and today very few locomotives, regardless of age, have sleeve-type armature bearings. Conversion of old stationary motors has lagged many years but the accompanying photograph of a shop job done recently at the Leslie (W. Va.) mine of the New River &

Against the Pin

Expected demands for coal will put industry "up against the pin" in 1943. Everybody connected with coal mining will be working under heavier pressure. As a result, ideas for saving time, cutting cost and promoting safety will be more valuable than ever. This department, as always, will devote itself to publishing the cream of the crop for the benefit of operating, electrical, mechanical and safety men. Perhaps you have a kink that should be aired in these pages. If so, send it along, with a sketch or photo if it will help to make it clearer. Acceptable ideas will be paid for at the rate of $5 or more each upon publication.

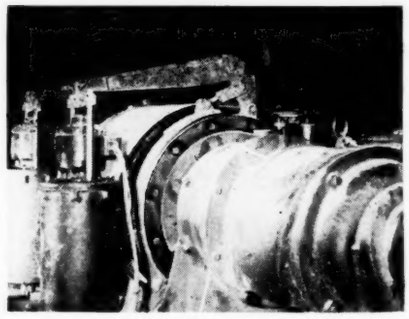
Pocahontas Consolidated Coal Co. is an evidence that old stationary motors are receiving attention.

Both of these motors had sleeve bearings but have been converted to Fafnir ball units. The motor on the left is a Westinghouse 250-volt d.c. Type HK 20-hp. 650-r.p.m. machine and the other a General Electric 220-volt a.c. Type KT 15-hp. 1,200-r.p.m. unit. The bearing assemblies, complete with ball bearings, were purchased from Allis-Chalmers. The old end shields were retained. On the G.E. motor, these were bored out and holes drilled and tapped for the four cap screws. On the commutator end of the Westinghouse, there was the extra job of welding on the four projections for accommodating the cap-screw holes. A grease cup of the cap-screw feed type was applied to each bearing.

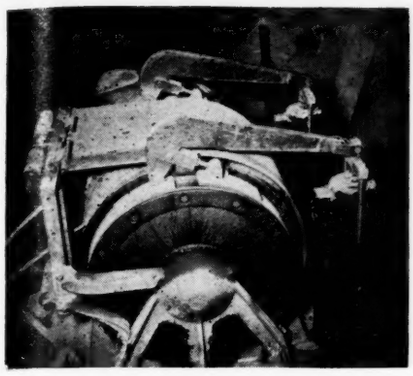
•

Slusher-Hoist Levers Fitted With Remote Control

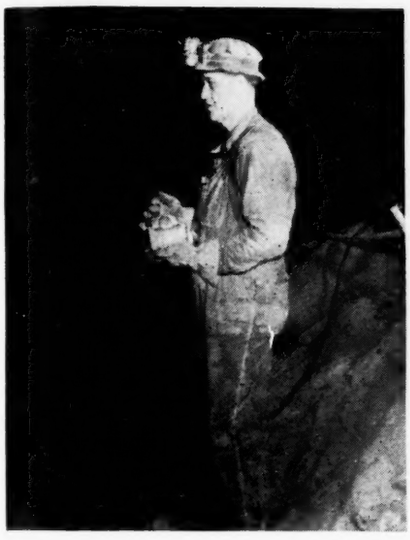
Fitting remote controls to the friction-clutch levers of the double-drum hoists used to pull drag boxes was mentioned early in 1941 by the late A. Fred Phelps, then superintendent of Bergoo No. 2 mine, Pardee & Curtin Lumber Co., Bergoo, W. Va., as the next step in his further development of the rope and drag-box mining he had installed, modeled from



Hauler with power-equipped friction clutch levers as viewed from the motor end.



Showing shape of levers and the mountings of their power units.



With the switch in his hand the signalman operates the slusher hauler from a distance.

Gilbert Smith system (*Coal Age*, February, 1939, p. 55; May, 1940, p. 29; September, 1940, p. 47; May, 1941, p. 52).

Mr. Phelps suggested that General Electric Thrustors be connected to the clutch levers and that a multiple-contact portable control switch for those levers be taken to the working face, thus rendering a hoist operator unnecessary. Apparently, in coal, that has not been accomplished, but recently it was done on a hoist of the same type used in slusher loading of ore at a Tennessee metal mine.

The application in that duty cut the stope-loading crew from two men to one. Formerly, one man operated the hoist and another signaled him from in or near the stope. Now the signalman standing at a point where he can see both stope and mill hole carries a portable pushbutton station and thus operates the hoist. In this mining, the mill hole is the space from which the ore is dropped into the mine cars.

The hoist is the Sullivan Type CFA211 double-drum hauler with a gearmotor bolted directly to the end of the frame. When this unit was purchased, the mining company's specification called for the new arrangement of levers with a Thrustor connected to each. These Thrustors are T30 units with 4-in. stroke and 400-lb. pull, and driven by ½-hp. motors.

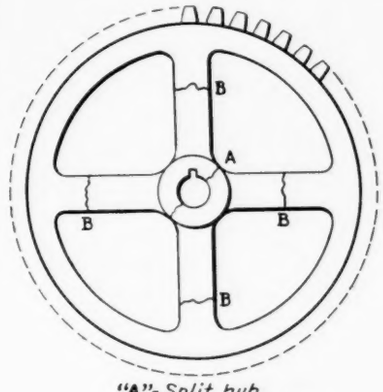
The hauler motor is a General Electric 35-hp. 220-volt Type K 1,750-r.p.m. unit. Specifications for the hoist are: flange diameter, 30-in.; rope capacity, each drum, 1,000 ft. of ¼-in. or 625 ft. of ⅜-in.; rope speeds, drum half full of rope, 300-f.p.m. head and 390-f.p.m. tail; pull on head rope with half-full drum 3,850 lb.

•

Arc-Welding Turns Two Tricks At Stripping Operation

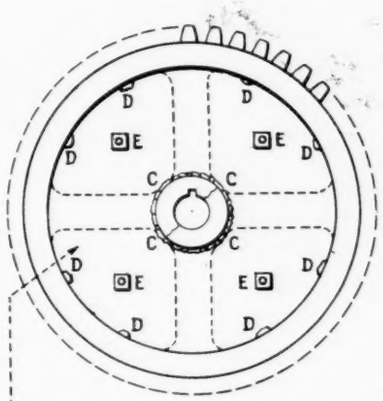
Two arc-welding jobs at the Fiatt (Ill.) mine of Truax-Traer Coal Co. merit attention. One of the head sprocket wheels of a coal elevator in the washer was broken as shown in Fig. 1, shutting down the plant. First, the hub sections were bound together by shrinking a ring on either side (Fig. 2). Two steel plates were cut to fit around the shrink rings and inside the wheel rim. Four bolts clamped the two plates tightly on the reassembled parts, holding them in line. These plates, one on either side, were then arc-welded to the hub rings and spot-welded to the wheel rim.

The cast-iron reciprocating feeder crank disk on the field transfer station, trucks to rail cars, would not hold up under the load. So it was replaced with an arc-welded steel crank disk made as follows: A circular steel disk was cut from rolled plate. Across the diameter on one side was welded a heavy flat steel bar, thick enough to hold the crank pin solidly in



"A"-Split hub
"B"-Broken spokes

Fig. 1—Location of breaks in elevator sprocket.



Two steel plates, one on each side of spokes
"E"-4 bolts
"D"-Spot-welded to rim
"C"-Welded to hub ring

Fig. 2—How elevator sprocket was repaired.

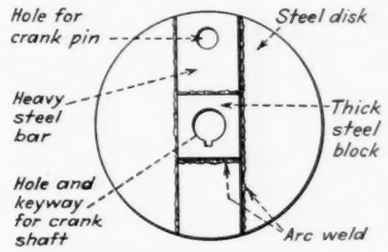


Fig. 3—New welded crank disk for reciprocating feeder.

place. A thick steel block was then welded on the center of this bar for a hub. Boring for the shaft, cutting a keyway in the hub and pressing a crankpin into place finished the job, which has stood up and gives no trouble.

•

Expedites Messages to Bosses Between Work Shifts

At Cadogan mine of the Allegheny River Mining Co., Cadogan, Pa., writes James Thompson, superintendent, coal is dumped two shifts per day and work inside the mine consists of three shifts, the inside official force including a mine foreman and seven assistants. One of the management problems is posed by the short period of time available between shifts for the bosses to communicate with one another on conditions in different mine sections.

At first with almost every shift change some boss would forget to "wise up" another boss about something in the short time available. Therefore it soon became customary for these officials to leave notes for one another on the table in the mine office. Sometimes, however, several bosses would read a note before the one for whom it was intended would get it.

To eliminate the confusion resulting from this arrangement, there was installed in the mine office an "official post office" consisting of a rack of pigeonholes, labeled with the respective names of the key men, including the superintendent, chief clerk, chief electrician, mine foreman and assistants. Each of such men, on entering the mine office at the beginning or end of each shift, always looks in his mail box to see if anyone has left a message.

By this system time is not wasted reading messages intended for someone else, as each gets communications meant only for himself. The scratch pads used for these notes have carbon paper attached so that a copy of each message is in the hands of the sender, thus eliminating many arguments over what one may have written to another. Of course, only high spots are put in writing, minor details being communicated in person, if necessary. Any mistakes in time sheets discovered by the chief clerk are sure to result in some boss finding a note in his mail box as he comes out of the mine.

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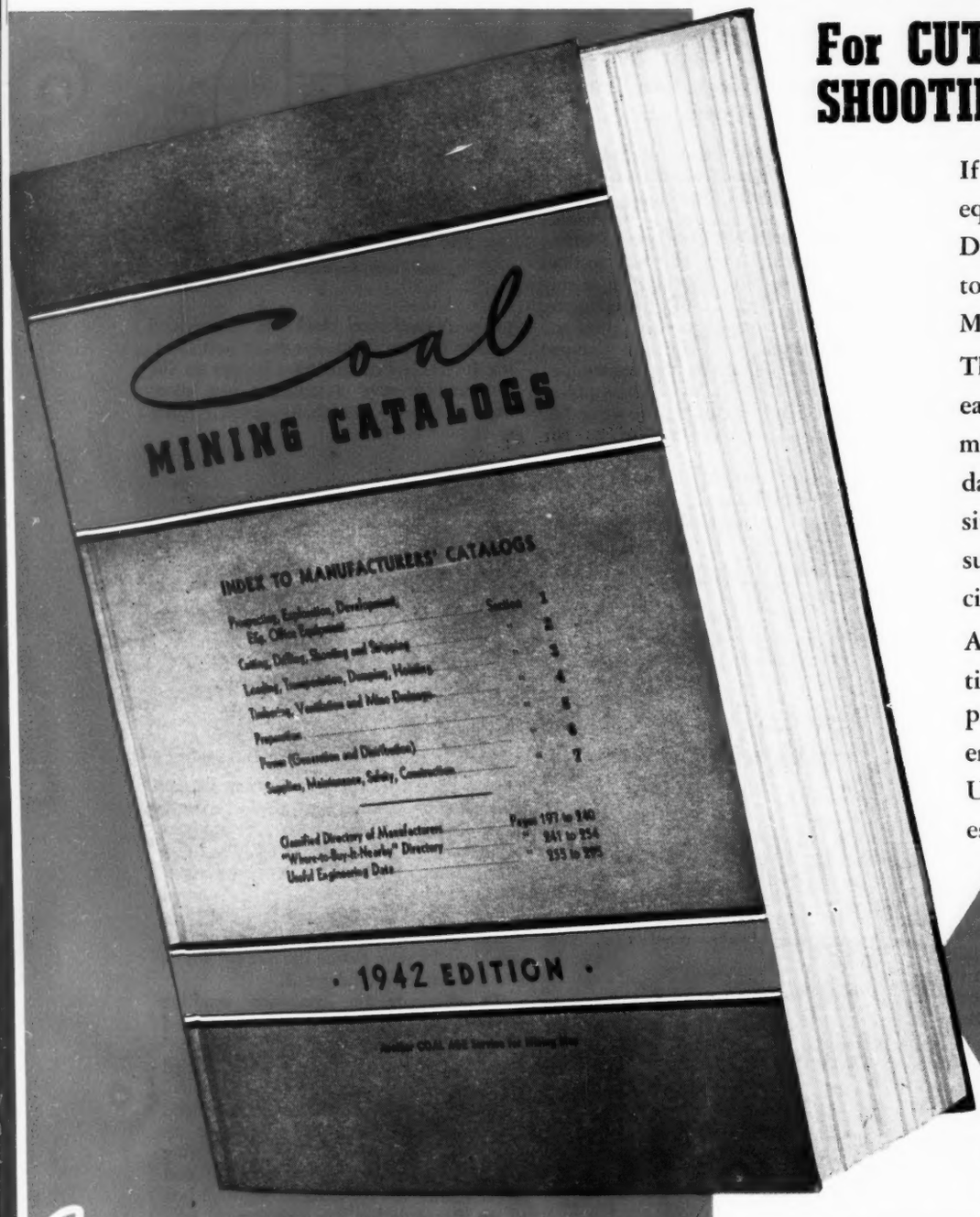

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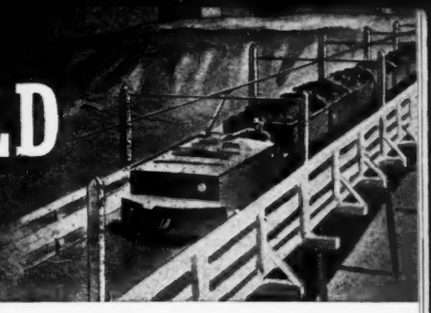


Causes, Cures and Correctives of Disasters Sought at Banquet Meet of Smoke Eaters

Successful Establishment of National Air-Raid Precautions Division Is Announced—Cleaning Lighted Lamp Gauzes With Compressed Air Is Hazardous—Mine Disasters Are Described

HOW attempting to clean the gauze of a lighted safety lamp with a blast of compressed air in an explosive atmosphere caused a severe lamp explosion killing two men was described by G. W. Grove, supervising district engineer, U. S. Bureau of Mines, at the 19th annual meeting of the National Mine Rescue Association ("Smoke Eaters") held at a banquet, Pittsburgh, Dec. 9. At that informal session, an address was made by Mr. Grove, in place of M. J. Ankeny, senior mining engineer, U. S. Bureau of Mines, regarding the explosion at Christopher No. 3 mine, Osage, W. Va.; also on another explosion that occurred at the mine of the Hitchman Coal & Coke Co., Benwood, W. Va., this latter disaster being described by J. E. Griffith, mining electrical engineer, U. S. Bureau of Mines. W. Dan Walker, Jr., senior mine inspector, of the same bureau, described another explosion.

Forms Air Raid Division

Report was made that, under the auspices of a committee of the association, headed by J. V. Berry, supervisor, safety, compensation and relief, Industrial Collieries Corp., an air-raid precautions division was formed during the year which appointed State chairmen and these, in turn, county vice chairmen selected largely from among coal-mining rescuemen. These county authorities have undertaken the organization of rescuemen and equipments of mining and other industrial companies, so as to be prepared to make effective use of such skill and *materiel* in the event of air raids. They have made it also their function to see that supplies are available for such use and that the equipment is in condition for safe and effective operation. The division proposes to inspect such material as is available, aid in its reconditioning, if needed, and give advice as to its maintenance. This is being done by local rescuemen in States as remote from Pennsylvania as Utah.

With the ever-looming menace of possible "block bombing" by 2- to 4-ton bombs, Great Britain recently has intrusted in large measure to mining men the rescue of persons whose lives are thus jeopardized, said Captain Edward Steidle, dean, School of Mineral Industries, Pennsylvania State College; this because of their experience with rescue equipment and with the safe handling of loose and dangerous cover, such as has to be handled where families are caught in cellars but are thought to be alive and temporarily protected in the triangular air spaces formed by floors, sidewalls and partly dislodged or broken floor beams. He hoped to organize further the work of the division with the aid of the Office of Civilian Defense, which doubtless will follow the example already set in Great Britain, where experience with heavy bombing has indicated just what type of organization and personnel will prove most effective.

Lamp Explodes Methane

Two men in the anthracite region, declared Mr. Grove, found that their lamps were extinguished by air escaping from a mine goaf. They tried to relight their lamps on the gangway by the relighting device, but, failing to do so, they came out to a compressed-air valve, ignited the wick of one of the lamps, causing a burst of flame within the gauzes of the lamp because of the combustible atmosphere by which they were still surrounded.

Turning on the compressed air to clean the gauze, the flame became so intense that it burned a hole in both gauzes and, in consequence, the methane in the gangway exploded. In another instance, a similar act caused a like burning of a hole in both gauzes and, in a third case, resulted in the burning of a hole in the inner gauze and in the oxidation of the outer one.

Tests are being made by L. C. Illsley, electrical engineer of the Bureau, into the conditions under which such gauzes are breached. Some lamps are more susceptible than others to this combined compressed-air-and-methane attack. When a ⅛-in. nozzle is used on the branch line by which the compressed air is conveyed, the worst conditions prevail.

The explosion at the Christopher No. 3 mine, said Mr. Grove, was caused by an accumulation of methane, which occurred because a door had been left open. The mine did not produce much methane. Permissible powder was used in shooting; rock dust was applied at low pressure, though only in places where track was present, to permit the travel of rock-dusting equipment. Coal dust was not allayed at the face by sprays. A fall of 0.2 in. of barometer in 12 hours followed by a further fall of 0.05 in. in the next 12 hours may have been a partial cause of the disaster, but that Mr. Grove regarded as questionable. The Pittsburgh bed, there 90 in. thick, was being mined; operation was by the modified block system, and where the explosion occurred the advance with one exception was in solid coal but approaching abandoned workings.

The dispatcher was the first to detect

Keeping Step With Coal Demand

Bituminous Coal Stocks

Thousands

	Net Tons Nov. 1 1942	P.C. Change From Oct. 1 1942	P.C. Change From Nov. 1 1941
Electric power utilities	20,452	+2.9	+71.6
Byproduct coke ovens	10,998	+4.1	+31.4
Steel and rolling mills	1,239	−0.9	+36.3
Railroads (Class 1)	13,648	+0.8	+42.9
Other industrials*	32,705	+2.1	+57.6
Total	79,042	+2.4	+53.4

Bituminous Coal Consumption

Thousands

	Net Tons Oct. 1942	P.C. Change From Sept. 1942	P.C. Change From Oct. 1941
Electric power utilities	5,782	+2.1	+22.1
Byproduct coke ovens	7,542	+3.4	+7.7
Steel and rolling mills	843	+8.8	+14.5
Railroads (Class 1)	10,275	+8.6	+27.3
Other industrials*	13,350	+12.8	+12.6
Total	37,792	+7.9	+15.8

*Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

Bituminous

Month of November, 1942, net tons	46,800,000
P.c. change from November, 1941	+5.3
January-November, 1942, net tons	526,925,000
P.c. change from Jan.-Nov., 1941	+13.2

Anthracite

Month of November, 1942, net tons	4,795,000
P.c. change from November, 1941	+20.7
January-November, 1942, net tons	55,350,000
P.c. change from Jan.-Nov., 1941	+6.2

Sales of Domestic Coal Stokers Vs. Oil Burners

	Coal Stokers	Oil Burners
October, 1942	5,548	2,333
P.c. change from Oct., 1941	−75.7	−87.3
January-October, 1942	80,092	49,345
P.c. change from Jan.-Oct., 1941	−52.3	−72.5

Index of Business Activity*

Week ended Dec. 12 (preliminary)	190.7
P.c. change from month earlier	−0.15
P.c. change from year earlier	+16.6

* *Business Week*, Dec. 19.

Electric Power Output†

Week ended Dec. 12, kw.-hr.	3,937,524,000
P.c. change from month earlier	+3.8
P.c. change from year earlier	+13.3

†Edison Electric Institute.

the explosion, and notified the outside by telephone. An assistant foreman went toward a point at which he hoped air might be entering the mine through a borehole from the surface. He found 53 men headed in the same direction and, telephoning to the surface, he arranged to prevent the starting of the mine fan and thereby managed to lead these men out to safety through the return airway before its air could be vitiated by the return products of the explosion.

Electricity at Fault

A suspension of coal dust that had accumulated on roof timbers and the fall of energized electric feed wires when timbers were being unloaded from mine cars undoubtedly explained the start of the explosion at the mine of the Hitchman Coal & Coke Co., said Mr. Griffith, adding that the action was aided by the presence of loose dust alongside a conveyor. Though the floor in all places was damp and slimy and occasionally even wet, the explosion nevertheless was of exceptional severity. It occurred on a Sunday when five men had gone into the mine to remove some roof timbers accompanied by one man who was to operate a hoist. Two men were killed outright and three died from serious burns. For a while one was missing. On the surface, several houses were damaged, many windows were broken, the tipple was almost destroyed and the massive mine portal badly creviced.

A man in the working part of the mine heard the explosion, feared something was wrong, so tried to telephone the mine office and, getting no answer, proceeded to leave and had his suspicions confirmed when he found two overcasts blown out. The haulage was on the return.

After the explosion 0.25 percent of methane was found, but this was when the mine was idle. There must have been more at the time of the explosion, when the workings were actively advancing in fresh coal faces with their loads of occluded methane. About 78,000 cu.ft. of air was circulating in each of two headings. An explosion, said Mr. Walker, occurred at a mine of the Pursglove Mining Co. in the Sewickley seam, here 60 in. thick with volatile matter 39 percent of the carbo-compound content, though somewhat less at the point of the explosion. Eight mechanical loaders were in operation and work was conducted for three shifts per day, producing 2,800 tons every 24 hours. The loading equipment was of permissible type but not in complete permissible condition. Electricity reached the seam through boreholes. Coal was drilled with hand-held electric units. One locomotive was using a "stinger" or nip to connect with the trolley wire.

May Have Come From Floor

Possibly there were cracks in the floor which brought methane from the Pittsburgh bed below, a seam that had not been worked at that point, but one which often in other mines acts as a reservoir of methane that will feed other superincumbent workings, but the methane may have come from roof falls in the goaf. No gas had been detected, however, for several months. The firebosses who had made their reports recorded no gas present detectable by safety lamps. At the mouth of a single crack in the floor 1.40 percent of methane had been found but after the explosion the U. S. Bureau of Mines investigators could find only small percentages of methane.

The two explosives magazines in the explosion area also had to be acquitted of causing the disaster; true they had burst, but without making a crater. The explosives apparently burned slowly and caused a bursting pressure, but evidence of detonation was absent. Apparently, most of the falls also could be acquitted. One occurred before the explosion, because it was surmounted by the coke from the charred coal which was formed by that disaster. One fall, however, in the heading, though not large, seemed to have been responsible. It looked smaller than it really was, for it broke after falling and was thrown on one side by the rescue force in its effort to reestablish transportation.

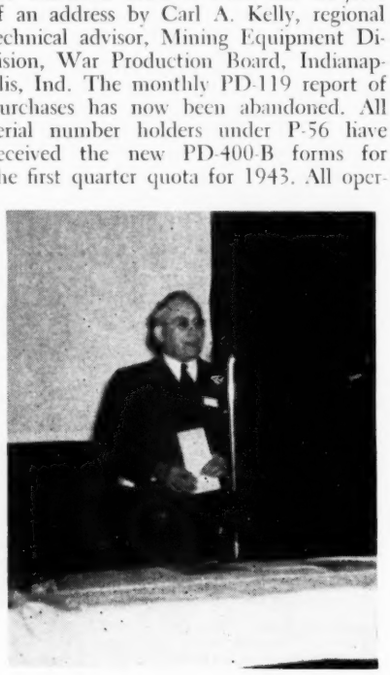
V. A. Stanton, district representative, Mine Safety Appliances Co., presided. For the ensuing year, Dean Edward Steidle was elected president; H. C. Mason, superintendent, H. C. Frick Coke Co., vice president, and J. W. Pero, chief, safety and inspection service, Christopher Associates, Inc., Morgantown, W. Va., secretary-treasurer.

Safety and Conservation of Materials Themes of Indiana Institute Meet

Repair Parts and Materials Situation Expected to Improve—Safety More Necessary Than Ever in War Time—Proper Recovery and Reclamation Methods Return Much Used Material to Service—Good Mining Machine and Cable Maintenance Essential for Efficient Output

THE MATERIALS outlook, safety in war time, conservation and recovery of mine materials and the care and maintenance of mining equipment and rubber-covered cables were the subjects of the annual meeting of the Indiana Coal Mining Institute, held Dec. 12 at the Deming Hotel, Terre Haute, Ind. A. K. Hert, general manager, Snow Hill Coal Corp., and retiring institute president, wielded the gavel. Approval of the investment of $1,500 of institute funds in War Bonds and cancellation of the 1943 summer meeting were among the actions taken at the business meeting.

Changes in the priorities set-up and the materials outlook were the subjects of an address by Carl A. Kelly, regional technical advisor, Mining Equipment Division, War Production Board, Indianapolis, Ind. The monthly PD-119 report of purchases has now been abandoned. All serial number holders under P-56 have received the new PD-400-B forms for the first quarter quota for 1943. All operators who do not file PD-25-A form under the Production Requirements Plan must furnish all the information requested on the new form, both for dollar value quota and quota allotment for raw materials.



D. W. Jones takes over as president

There are not enough raw materials to go around, but conditions for the coal industry are expected to improve, although the Army and Navy come first. It is certain all requested materials for the first quarter of 1943 will not be obtained. This "is a direct challenge to your ingenuity," declared Mr. Kelly. "First use your wits," then, if you must have more, file PD-25-F and include all necessary information. This applies to every application.

Because of better ratings to manufacturers, the delivery of repair parts is expected to improve. The situation in delivery of rerolled rail, lumber, rubber belting, wire rope, and bare and insulated copper wire also have improved. Pumps are classed as new equipment and require authorization before placing orders.

The new Controlled Materials Plan is to supersede gradually the Production Requirements Plan, and will assure essential needs. Coal operators must schedule their equipment needs far ahead—sometimes as much as a year.

Strip operators will be concerned about Order L-192, effective Dec. 10. When application is made for equipment listed in L-192, file complete PD-556 form in quadruplicate with WPB regional office for permission to buy. Priority for use is had from the Mining Equipment Division, Washington. Trucks of any size will be few and far between.

Reviewing practical safety methods, Harold Corzell, Knox Consolidated Coal Co., declared that "every man in mechanical mining is a specialist." It soon will be impossible to replace a man, so breaking in new ones is becoming more and

THE LOADING HEAD ON A *Clarkson* UNIVERSAL DIGS OUT THOSE TIGHT CORNER SHOTS PERFECTLY . . .

The operator can raise or lower the head at will—he can follow the floor of the mine with ease. In low coal as well as high the CLARKSON UNIVERSAL produces large tonnage at exceptionally low per-ton cost. Has high flexibility—vertical or horizontal adjustment and is operated from one central point.

LOWEST LOADING MACHINE ON WHEELS

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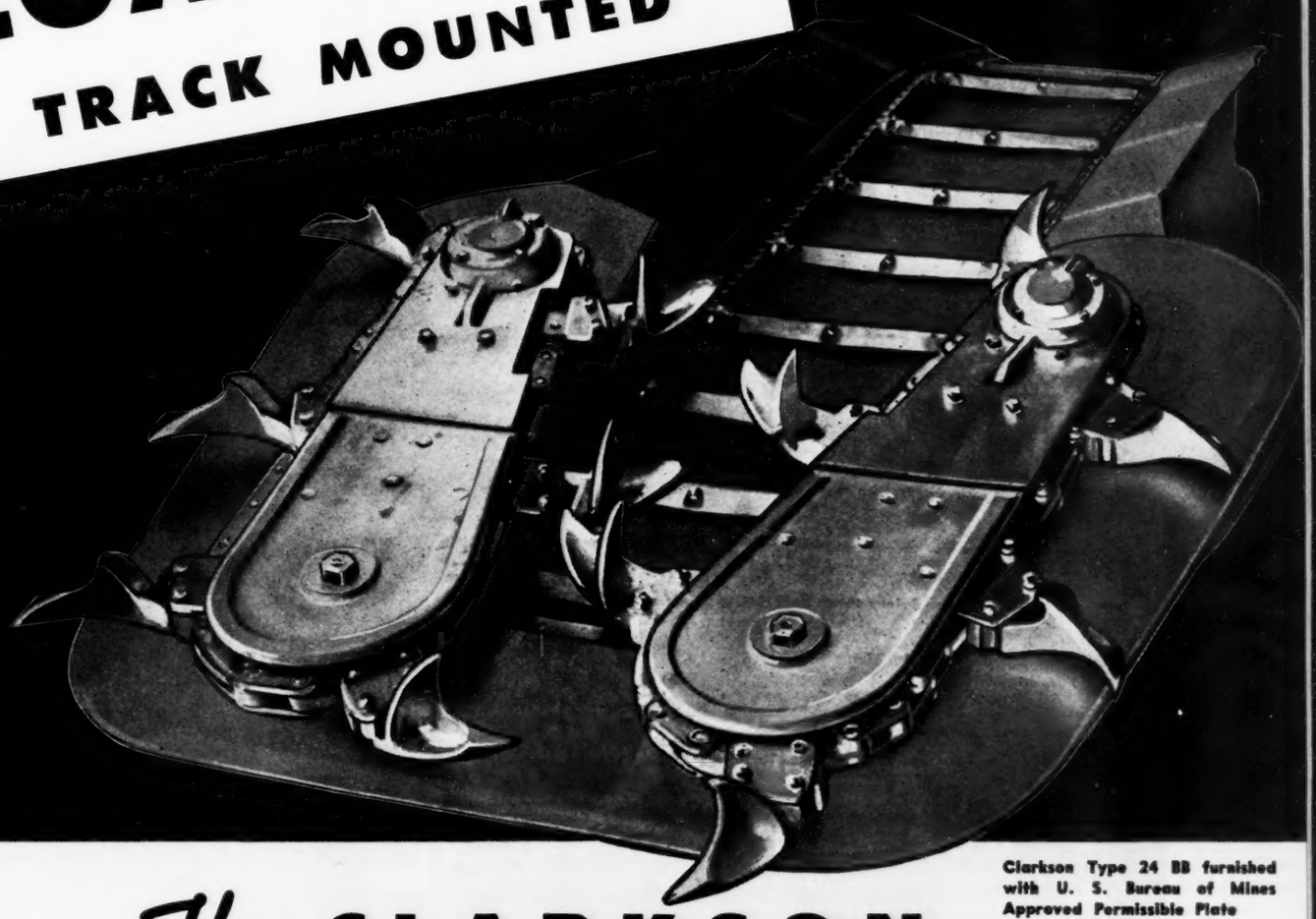

Clarkson Type 24 BB furnished with U. S. Bureau of Mines Approved Permissible Plate

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NASHVILLE ILLINOIS

more important. A safety program must be carried out. Foremen must be educated to save the lives of men and protect the usefulness of machinery. The foreman in turn must instruct, encourage and observe the men under him, granting no special privileges to any.

All subnormal conditions must be corrected. Haulage road and roof are two items that should always be in good condition. First-aid materials must be convenient, with a telephone system in first class operating condition. It is up to the chief foreman to see that the work of the foremen under him is satisfactory.

"We get out of safety just what we put into it," said Henry A. Wallace, chief mine inspector for Indiana, in the ensuing discussion. He observed that the 1941-42 record of twelve fatalities in mining 9,965,000 tons was the best Indiana had ever experienced. Warning that war conditions made it necessary to train new men for jobs strange to them, he advocated return to the old-time practice of putting new men in the care of experienced heads. Because Indiana mining laws, revised in 1923, are no longer suitable for modern mining conditions, they need revision.

Charles Herbert, supervisory engineer, U. S. Bureau of Mines, Vincennes, Ind., complimented the coal-mining industry for holding its accident rate level while the national industrial rate had gone up sharply. A. H. Cross, general superintendent, Walter Bledsoe & Co., cited a case of using salt blocks to prevent water freezing as it seeped in and ran down the sides of an air shaft.

Following an illustrated phonographic talk on scrap by the Conservation Division of WPB, a series of five technical papers and talks went into the war-time need to recover, conserve and rehabilitate essential mine materials, and care and maintenance of mining machines and rubber cables.

Making Cables Last

"It is imperative that we make what we have last as long as possible," said Placide Mayeur, mine foreman, Princeton Mining Co. He strongly advocated the reuse of worn-out and obsolete material for other jobs, where it can be made serviceable by working over, splicing, changing to less strenuous work or applying to a different type of service. Examples include: copper wire converted to track bonds, jumpers and hot hooks; worn trolley wire moved to lighter panel work; converting worn rails to crossbars—the short pieces to frogs and switch points—and recovery of all track and trolley material from worked-out sections before falls make that work difficult. A major factor of conservation at Kings mine was placing a motor-driven rail-straightening machine inside, where more than 100 tons of 30-lb. rail was processed and immediately put back into service.

Wooden ties not relayable are used for cribbing. Building up locomotive tires by arc welding is being more widely employed. Worn or broken shafts and axles have reuse value when converted into parts of smaller diameter. Old axles make good sledges for use on rock falls. Ball bearings may be reground if not too badly

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SAVES VITALLY NEEDED METAL

The national reputation of Wood shovels, spades and scoops for finest quality, has been built on their ability to outwear and outlast. This wearability of Wood tools now has double value to our country. First–the many already in use will save vitally needed metal by continuing to stand up to the job without requiring replacement. Second–the many now being produced for our armed services, will likewise earn service stripes for unusual time of active duty.

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The finest, exclusive feature found in closed-back and open-back shovels, spades and scoops.

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★ ***HELP WIN THE WAR***
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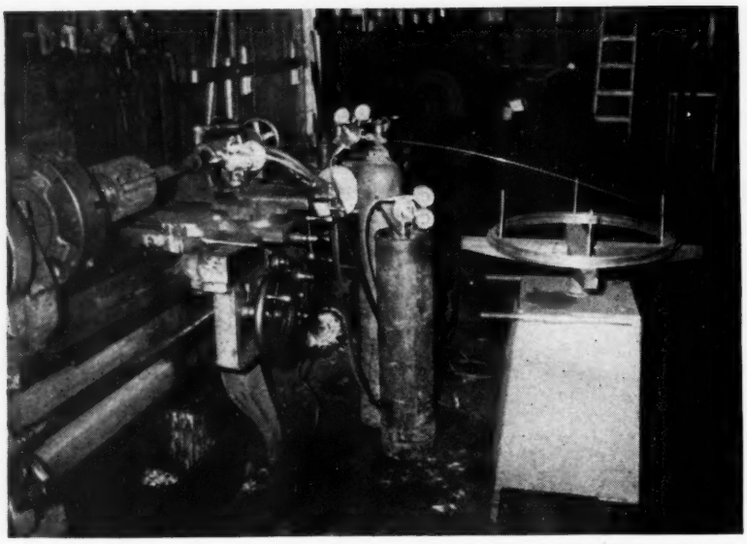

Complete set-up for metal-spraying, except gas regulator, No. 7 mine, Consolidated Coal Co., Herrin, Ill.

worn. Among the newer means of restoring worn surfaces are metallizing guns. They may be used, in many cases, to restore shafts, axles and other parts to "original size and value."

"The problem of keeping mining machinery in working order is of the utmost importance. . . . The causes of . . . failures are many. Some are unavoidable, but for the most part they can be prevented," declared Joe Valentine, chief electrician, Baker mine, Glendora Coal Co. "When machines are handled properly and with the proper power and oiled as they should be, they give maximum service."

While the fundamental elements of all machinery are basically the same—such as gears, shafts, bearings and motor power—increased complication of mining equipment calls for better training of mechanics in maintenance, said Mr. Valentine, also stressing the need of keeping safety devices in perfect working condition and adjustment. "We often pay too little attention to those devices which are for the purpose of eliminating serious breakdowns. . . . When safety devices are neglected, you may expect anything to happen."

Maintenance is favorably affected by good voltage, keeping loads within machine capacity, accurate assembly of parts, correct and adequate lubrication and, finally, by wise selection and careful training of the workmen who handle the job.

Care and maintenance of rubber-covered cables under two heads, in service and when idle, was outlined by James W. Gibbe, foreman, Dresser mine. Proper care begins when the cable is delivered to the supply room, where it should be stored in a cool, dark, dry place, because these conditions preserve the rubber. When delivered to the mine to be put into service, cables should be in correct lengths for the application to avoid investment waste and unnecessary maintenance cost. The correct size is even more important on the double score of first cost and satisfactory power to the machine.

When idle, cables should be wound on the reels of the equipment they serve to prevent injury to both rubber and conductor. "All cables should have a spring connector and fused nips where they are attached to the feeder line," to eliminate heating and protect the cables in case of a short circuit. Cables will last longer with reel-equipped machines than with machines not so equipped.

To avoid damage to cables by fouling on timbers and switches, they should be dragged by hand when such handling is necessary, to avoid excessive abuse. Cable splices made by the machine operator usually are hastily done and are more or less temporary. These should be checked by the electrician and properly made up. Today's cables, largely built from reclaimed rubber, must have good care for maximum life.

The recovery of mine materials for reuse, much of which may serve repeatedly, has always been a major problem for the mining industry. Now, a war has brought scrap to the forefront, making it doubly important to do a thorough job. About a year ago, the Saxton mine, Walter Bledsoe & Co., decided to replace its haphazard method of recovering track and trolley material, timbers and pipe lines with a systematic method calculated to save time and yield more material. The method, described in detail by H. C. Bean, is as follows:

A foreman with a crew of eight men was placed on the fourth shift, 11 p.m. to 6 a.m., staggered to provide six men on each shift for six shifts a week. Not only do they recover material but they transfer the usable part to sections of the mine where it is needed. This crew also is available to clean up falls and wrecks, fix pipeline leaks and do other work that regular-shift men may not have time to complete.

Voluntary collection of scrap by the miners also is provided for. Boxes placed throughout the mine carry signs reading, "Save scrap to whip the Japs." Two men who deliver supplies also gather the scrap from these boxes and bring it on top. Some accumulated scrap is too large for convenient loading. On Saturdays, usually idle days, three men go below with gas torches, cut up this big scrap, load it in cars and take it above ground.

Two examples of improvised methods of rehabilitating used mine material were offered by Harry Keenan, superintendent, Glendora Coal Co. Samples of rail bonds made of wire scraps to which steel terminals are attached by 40 tons pressure in a hydraulic press were shown. The terminals are made of short sections of steel pipe slipped over the ends of the wire.

The other gadget is a track-spike straightener. This consists of a pair of short, straight, steel bars machined so that each bar forms half of a complete die. Matching grooves form square holes into which the crooked spikes are driven with a heavy hammer. The completed die has trunnioned ends which fit into holes in the sheet-steel base. When the spikes are driven in, the die is reversed and the straight spikes are driven out, falling into the keg underneath. One man reclaims about 3,000 spikes a day. The mine has not bought a new spike since last July.

The institute closed with the annual banquet, at which the John A. Templeton Safety Award was presented to Mine No. 1, Knox Consolidated Coal Co., for the best safety record for the year ended Oct. 1, 1942. The toastmaster was Dr. W. P. Allyn, Indiana State Teachers' College, with E. A. Richardson, Evansville, Ind., the entertainer.

INDIANA OFFICERS

New officers were chosen as follows at the annual meeting of the Indiana Coal Mining Institute in December:

President—David W. Jones, general superintendent, Princeton Mining Co., Princeton, Ind. Mr. Jones succeeds A. K. Hert, general manager, Snow Hill Coal Corp.

Vice Presidents—Birch Brooks, superintendent, Saxton mine, Walter Bledsoe & Co.; H. M. Ferguson, president, Clinton Coal Co.; and Peb G. Conrad, general manager, Knox Consolidated Coal Co.

Secretary — Harvey Cartwright, commissioner, Indiana Coal Operators' Association, Terre Haute, Ind.

Executive Board—Joseph Anstead, electrical engineer, Templeton Coal Co.; A. H. Keenan, superintendent, Glendora Coal Co.; Harry Cruikshank, electrical engineer, Walter Bledsoe & Co.; M. F. Cunningham, Goodman Mfg. Co.; V. S. Meister, Jeffrey Mfg. Co.; and Mr. Hert.

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Bureau Projects to Continue

A majority of the war-time construction projects of the U. S. Bureau of Mines, ordered suspended by the War Production Board Oct. 20, now may be continued, Secretary of the Interior Ickes announced late in November. Projects which may be

Save Production Time Here!

PROBLEM: That red film of oil you see on the journal above is ample—at the time the bearing is oiled. But before the next application, the oil will drain off. Just a tissue-thin film — boundary lubrication — will remain. If you use ordinary mineral oil the film may not stand up. Metal-to-metal contacts between journal and bearing may result. Bearings fail. Important machines stop producing.

ANSWER: There is an oil specially made to meet this problem. It is called Gargoyle Vactra Oil. It has an extremely tenacious, persistent film that resists wiping action and rupture even when a film of microscopic thickness remains. Wear, temperature rise and power consumption are minimized with an extremely small supply of this oil. You are assured dependable operation and economy, too.

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SOCONY-VACUUM OIL COMPANY, INC.—Standard Oil of N. Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. White Eagle Div. • Wadhams Div. • Southeastern Div. (Baltimore) • Magnolia Petroleum Co. • General Petroleum Corp.

CALL IN SOCONY-VACUUM

COMING MEETINGS

- **American Society of Heating and Ventilating Engineers: 49th annual meeting, Jan. 25-27, Hotel Gibson, Cincinnati, Ohio.**
- **Illinois Coal Strippers' Association: annual meeting, Feb. 9, Chicago.**
- **American Institute of Mining and Metallurgical Engineers: annual meeting, Feb. 14-18, Engineering Societies Building, New York City.**

continued include helium plants, explosives research laboratory, synthetic oil project and pilot plants and laboratories working on aluminum. Decision was deferred on a pilot plant for zinc ore reduction by the gaseous method and for another pilot plant on the production of sponge iron directly from the ores by reduction with solid fuels and with gas.

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OPA Asks Freight-Rate Cut; Consumer Pays Tax

Reopening and reconsideration of Ex Parte 148, Increased Rates, Fares and Charges, 1942, was requested in December by the Office of Price Administration through Leon Henderson, director. The proceedings in question resulted in the railroads being authorized to increase freight 3 to 6 percent for the duration of the war and for six months afterward, with specific increases on coal of 3c. for rates under $1 per ton and 5c. for those over $1. Discontinuation of the increases is asked by OPA on the ground that they yield a return in excess of their 1941 earnings, which was stated to be the carriers' objective.

A similar petition looking to vacation of the increases on agricultural products was asked by the Secretary of Agriculture, and on Dec. 12 Luther Harr, Bituminous Coal Consumers' Counsel, asked cancellation of the coal increases.

Consumers of all grades of coal and other solid fuels will pay the 4c. per net-ton transportation tax effective Dec. 1, 1942, under the terms of the 1942 Revenue Act, OPA announced Dec. 5. Under the OPA ruling, the tax may be passed on to the ultimate consumer, but it must be stated separately from the price the consumer pays for the coal and may not be computed in determining maximum prices nor charged except on coal on which the tax actually has been incurred.

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Gas Line Opposed

Permission for complete intervention by coal, railroad labor and other interests in gas cases before the Federal Power Commission is a feature of developments in the application of the Tennessee Gas & Transmission Co. to the Federal Power Commission for authorization to construct

DON'T TIE UP WAR TRANSPORTATION WITH FROZEN COAL

A simple freezeproofing application of calcium chloride as cars are being loaded at the mine will prevent yard tie-ups from frozen coal. The treatment also speeds unloading and helps to prevent disintegration and lowering of coal grades. Freezeproofing thus becomes good business as well as a substantial contribution to war transport.

This year cars must not be delayed a single day. Every car has to be kept rolling to avoid a transportation pinch. Freezeproofing is essential for prompt and easy unloading. Of course, coal dustproofed with calcium chloride is automatically protected against freezing. Write us today for our new Bulletin Number 37 with complete data.

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a major natural-gas line from Louisiana to the Appalachian region. Hearings originally scheduled for Dec. 15 have been postponed to Jan. 18 at Nashville, Tenn.

Intervenors include the Southern Appalachian Coal Operators' Association, United Mine Workers of America, Brotherhood of Railway Trainmen, Railway Labor Executives' Association, Louisiana Department of Conservation, Kentucky-Tennessee Natural Gas Corp., Gulf, Mobile & Ohio R.R. Co., Louisville & Nashville R. R. Co., Illinois Central R.R. Co., Nashville, Chattanooga & St. Louis Ry., City of Cleveland, Arkansas Department of Public Utilities, Louisiana Public Service Commission, National Coal Association and the Anthracite Institute.

Mining Congress Holds Meeting at Pittsburgh To Weigh Technical Committees' Reports

Can Restrict Dust Suspension Without Using Much Water—Profitable to Expend Thought and Money on Rail Systems—A.C. Current Reduces Power Cost at Face—Fractures to Rule Room Directions

NINE technical committees reported the gist of their several findings at the afternoon session of the eighth annual conference of the Coal Division, American Mining Congress, Pittsburgh, Pa., Dec. 1. These reports covered phases of ventilation, mechanical loading, conveyor mining, haulage roads, underground power, safety, roof action, surface preparation and stream clarification.

Opening the morning session, Julian D. Conover, secretary, American Mining Congress, declared that the coal industry had been asked to increase its production of bituminous coal over a period of only three years from 400,000,000 to 600,000,000 tons annually and its production of anthracite more or less proportionately. But this 200,000,000 increase in tons of production is more than twice as many tons as are produced annually by the ferrous industry of the Lake Superior iron region, which yearly produces 92,000,000 tons. Yet this is, far and away, the greatest annual output these immense iron ranges have produced in their entire history. The increased tonnage demanded of bituminous coal is nearly twice as great as the entire tonnage of the grain crops of the country and 65 times as great as the entire weight of the cotton crop. That increase is of the same order of magnitude as the total volume of dirt removed from the Panama Canal.

The speaker emphasized the fact that he was still talking only of the yearly increase of production of coal and comparing it not merely with increases but with total annual productions of these other items, adding that the required production of anthracite and bituminous coal (660,000,000 tons) staggered the imagination, so that the immensity of the demand could not be visualized or grasped. This increase is asked while the key men of the industry are being drafted or are leaving to take higher paid jobs in munitions plants, and while their places, as fast as they leave, have to be filled by other men who have to be trained for such activities.

Studies were being made into ventilation survey methods and the removal of coal dust from mine air, declared Walter E. Housman, mechanical engineer, H. C. Frick Coke Co., for his committee on ventilation. Volume of air, said Raymond Mancha, chairman of the subcommittee having the first study under consideration, usually is taken by a man standing in the airway with an anemometer in his hand, the instrument being held in the center of the airway or moved around so as to occupy as nearly as possible all of several sections of equal area in the airway in turn, so that, at the end of a minute, the movement of the air in every one of the several sections will have contributed proportionately to the record, this requiring the observer to alter his position continually throughout the traverse. In calculating the volume of air, correction is made for the space occupied by the observer.

The subcommittee, however, recommends instead that the man station himself at arm's length downstream from the cross-section where the measurement is to be made but use a stick sufficiently long to permit him to stand in one position throughout the traverse, holding the instrument successively for 5 seconds in each of twelve sections of the airway to be measured. If there are posts, no correction should be made for their presence unless the width of the obstruction should exceed the width of the distance between instrument measurements.

In discussing dust suppression in underground coal-mining operations, D. H. Davis, chief chemist, Pittsburgh Coal Co., stated that the company has confined its studies of the use of sprays in cutting to operation of the shortwall machine. He stated that these cutters are the most readily equipped for the suppression of dust. When coal is discharged from a belt, the fines tend to drop nearer the pulley than the coarser particles. An effective method of wetting these fines is to mount flat "fishtail" or "sheet" sprays directly under the belt pulley so that the spray impinges on the fines as they are discharged from the belt. By such an arrangement, the belt is not directly wetted by the sprays.

The efforts of the Pittsburgh Coal Co. are being made to obtain effective dust reduction at the principal sources of dust while using only a minimum of water. It has been found that dust can be effectively suppressed with much less water than is generally believed. For instance, in a 21-ft. face with an 8-ft. undercut, about 12

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AMERICAN "AC" Type ROLLING RING CRUSHER

Get assurance of uniform sizes for either Stoker or Pulverized Coal as you crush larger tonnages

★ **Huge tonnages of stoker coal will be required in 1943 as the speed of our victory program increases.**

You can amply and economically provide for your CRUSHING requirements with the American Rolling Ring Crusher. It speeds up the work by staying on the job and by action of the crushing parts.

The crushing parts are: breaker plate, grinding plate, grate bars, and rings which weigh about 27 lbs., made of manganese steel. Centrifugal force is applied at right angles to a horizontal shaft. The rings roll as they grind. They are thrown back when they encounter non-crushable material, protecting the crusher from damage by foreign materials. This flexibility or "give" makes the crusher self-acting against tramp iron. Users have crushed hundreds of thousands of tons with no time-outs for maintenance and no repair or replacement costs.

You get greater range of reduction—uniformity of sizes—extreme simplicity of operation and a reduction in power requirements.

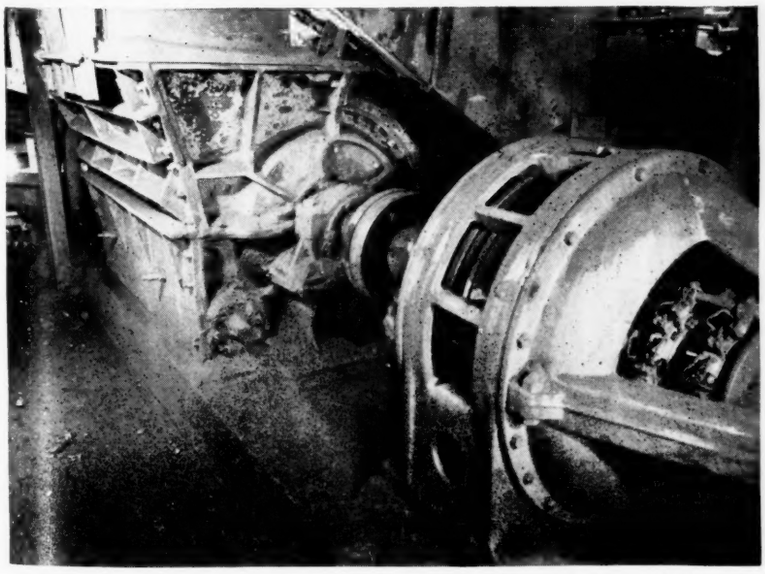
The American Rolling Ring Crusher is built in many sizes. Each unit is arranged to meet the particular requirements of each application—each is compact, externally adjusted, easily accessible.

Write us as far in advance of your crusher needs as possible to insure fastest delivery.

Why you get Splitting Action instead of Crushing

● **Patented reversible manganese steel SHREDDER RINGS are found only in the American Rolling Ring Crusher.**

The Rings have twenty cutting edges or teeth and are designed to maintain their outward position by centrifugal force at specific speeds. In contact with solid metal, the rings are momentarily deflected from their usual course, because they are free to swing back out of position. No shear pins or other safety devices that require attention.



Size 60S rated to crush 300 tons per hour of 6-inch lump down to ¾-inch.

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gal. of water is being applied through two spray nozzles mounted on either side of the cutter bar, using a spray pressure of 35 lb. per square inch. About 1 percent of free moisture is thus added to the cuttings.

How to keep the sprays working without interruption is the big problem. This can be solved in the main by adequate protection and proper design of piping and sprays. Until the problems of spray operation are perfected, study of wetting agents and of optimum quantities of water can be delayed. The use of an oil emulsion has made it possible to remove cutting bits at the working face, whereas, without this material in the spray water, the machine had to be sent at frequent intervals to the shop for bit removal.

Present studies on mechanical loading, said S. M. Cassidy, manager, Weirton Coal Co., pertain to the best method of supervising that operation which, said W. B. Jamison, chief engineer, Jamison Coal & Coke Co., has been limited to underground loading. No matter how much work the committee might do, it could not set down a set of rules for any one company, for such a plan must always keep in mind the abilities of the key man and the local conditions at the colliery thus planning.

More mistakes are made in organization than in mechanical operation, declared E. H. Johnson, Jeffrey Mfg. Co. There are seven supervisers whose work is involved: the mine superintendent, mine foreman, safety or ventilation engineer, the master mechanic, the assistant foreman, the second assistant foreman, face boss or unit boss—whatever he may be named—and the transportation boss. This multiplication of bosses did not appeal to Richard Maize, Secretary of Mines, State of Pennsylvania, who said that the State law recognized only the mine foreman and assistant mine foreman and not the face boss, unless he is a qualified assistant mine foreman and signs the assistant mine foreman's report book. He then is held responsible for his section and is subject to the same rules and penalties as govern the mine foreman.

For his committee on conveyor mining, studies in belt conveyors for gathering service, said T. F. McCarthy, general superintendent, Clearfield Bituminous Coal Corp., have been published by Carel Robinson, consulting engineer, Charleston, W. Va. Several layouts for conveyor operation were shown by Roy Bigelow, assistant to sales manager, Goodman Mfg. Co., with rooms advancing, rooms retreating and double-panel retreating system as planned for entry and room development.

In the absence of R. V. Clay, vice president, Hanna Coal Co., C. C. Hagenbuch, mining engineer of the company, presented two studies, one made of the inventory records of ties and rails to find how often they can be reused and another of the costs of labor. and material involved in placing track with certain layouts and types of equipment. Steel ties in rooms, declared A. Reamy Joyce, district sales manager, Wood Preserving Division,

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COAL FOR VICTORY

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LACK OF COAL CAN LOSE WAR

— Says WAR PRODUCTION BOSS

War Effort Stressed in New Koppers and Island Creek Employee Papers

"Coal for Victory" and a yet unnamed weekly paper were new additions in December to the list of company-employee publications engaged in promoting coal's participation in the war effort. "Coal for Victory" (masthead and first-edition headline shown above) is issued by the Koppers Division, Eastern Gas & Fuel Associates, for distribution among 15,000 employees in Pennsylvania, West Virginia and Kentucky. The so-far-unnamed publication is issued for employees of the Island Creek, Mallory and Marianna Smokeless coal companies and the Pond Creek Pocahontas Co., in southern West Virginia. The first edition offers a $50 war bond for the best name, with $30 in war stamps for the second, third and fourth choices.

If wire ropes are to give their best service—yes, even longer-wearing **HAZARD LAY-SET PREFORMED**—they must be lubricated regularly—and correctly. Not only will proper lubrication protect the many wires from corrosion and excessive wear, but will permit the internal wires which move one against another when the rope passes over a sheave or winds on a drum, to slide more freely and with less friction. For some short-lived services, factory lubrication is sufficient. For others, additional lubricant must be added in the field, and unless this is done with sufficient frequency, your wire rope is doomed to fail before its proper time. And this is no time to waste steel.

HAZARD LAY-SET PREFORMED WIRE ROPE ordinarily gives so much better, easier-handling, longer service than ordinary non-preformed rope that occasionally operators take its exceptional qualities for granted and forget the oil can. Don't do it. Lubricate your **LAY-SET** correctly, and you will get even *longer* service—even *greater* dollar value. All Hazard ropes identified by the Green Strand are made of Improved Plow Steel.

HAZARD WIRE ROPE DIVISION Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Tacoma
AMERICAN CHAIN & CABLE COMPANY, INC. Bridgeport • Connecticut

• IMPORTANT SUGGESTIONS

Clean wire rope thoroughly before lubricating. Use kerosene and wire brush.

Passing the rope through high-pressure jetted steam has proved a very effective means of cleaning, especially larger diameters.

Wipe off excess lubricant.

Frequent lubrication with light-bodied lubricant is better than infrequent treatment with heavier lubricants.

Lubrication of any wire rope is sufficiently important to warrant calling in one of the industrial lubrication men employed by oil companies or a Hazard man. These men can tell you which lubricant will handle your problems best.

HAZARD LAY-SET *Preformed* WIRE ROPE

Koppers Co., have an average life in rooms of 17.4 uses and in heading tracks of 40.5 uses.

Costs of panel rail layouts were described by Messrs. Haskell, sales engineer, West Virginia Rail Co., Huntington, W. Va.; F. G. Jones, sales engineer, Carnegie-Illinois Steel Corp., Pittsburgh, Pa., and J. R. Uhlrig, sales engineer, Bethlehem Steel Co., Bethlehem, Pa. These figures showed that with track provided with completely fabricated turnouts (Class 4), large savings may be expected over track with stock material, random rail lengths, etc., but with steel ties (Class 1), when all factors of replacement are considered.

Slides were shown of wiring systems for d.c. and a.c. conveyor mining by C. C. Ballard, mechanical and electrical engineer, New River Co., exhibiting recommended practice for positive and return circuits to all machines in any one unit; this on behalf of the committee on underground power, of which he is chairman. Fred L. Stone, engineer, mining section, General Electric Co., said that a saving of 20 percent and in some cases much more can be made in the power bill by the adaptation of a.c. instead of d.c. at the mine face. A.c. motors have characteristics ideally suited to mining conditions. Unfortunately, however, those operators who are fully equipped with a d.c. system in many cases could not justify the expense of a changeover. However, any new mines unquestionably should be powered by a.c.

Low-voltage a.c. equipment at a plant of the Electro Metallurgical Co., Alloy, W. Va., was discussed by O. G. Stewart, mining engineer. Powell Barlow, Charleston, W. Va., presented a progress report for the subcommittee on color standardization for wire terminals.

To Find Why Roof Falls

Appointment of a committee to determine means to reduce haulage accidents was announced by L. C. Campbell, general manager, Koppers Co. Other proposals cover rock-dusting, safety education as well as standard safety rules. Collection of samples of such roof as falls in the mine was announced by Frank G. Smith, general superintendent, Sunday Creek Coal Co. If the roof varies materially in composition, each section will be sampled separately and, if a channel section cannot be removed, equal quantities of rock will be taken per foot of section. Cores of the trouble-making section tightly wrapped in cellophane or other waterproofing material may be shipped to the laboratory as soon as possible after the core has been cut. Samples will be taken on new and old workings; and, to find why the roof is troublesome, others will be made of the same horizons at places where the roof does not fall, so as to indicate the causes of failure.

That direction of fractures should be considered in planning mine workings had always seemed essential to Paul H. Price, State geologist of West Virginia, who said he had made extensive studies into the direction of cleats in coal and in rock and hoped that the questionnaires

accompanying applications for samples would, when filled, do much to connect, with roof action, the effect of accordance with, or obliquity from, the orientation of rock or coal cleats and even would reveal a law relating to this matter.

Simplification of screen sizes is being studied by the committee on surface preparation of coal, asserted T. W. Guy, consulting engineer, Charleston, W. Va., and the committee's chairman. Another project planned was substitutions of materials in construction of preparation plants.

If the number of screen sizes could be reduced, observed C. P. Procter, superintendent, Champion No. 1 preparation plant, Pittsburgh Coal Co., time now consumed in changing screens could be saved, inventories could be reduced and there would be less difficulty in disposing of coal that is segregated in making odd sizes for certain consumers. Such remaining sizes find few purchasers. Sometimes screen changes take only a few minutes; sometimes as much as 8 hours. The longer changes must be made at night; the shorter are undertaken by day, and they upset operations not only on the tipple but in the mine. Making unusual sizes puts production out of balance; the consequent sizes must be put in railroad cars to await a purchaser. Reduction in size also will simplify price structures. Some price districts have only five sizes and some as many as 25.

It is hoped, added Mr. Procter, to study the use of glass, concrete and tile as conveyor bottoms in tipples and breakers. For every percent of ash in the nation's coal, said W. R. Chedsey, consulting engineer, Columbus, Ohio, six million tons of "ash" has to be hauled, thus burdening the railroads. Could not middling coals with higher ash be made for local use, and better coals prepared for more distant transportation?

Stream Clarification Study

An anthracite subcommittee has been formed to study stream clarification, not, as before, for the reduction of acid content, although this study continues, but primarily to see what can be done to reduce the quantity of solids entering creeks and rivers. H. H. Otto, mining engineer, Hudson Coal Co., said that this is an important consideration and that State officials are studying the problem. A committee of three operators and the Deputy Secretary of Mines, J. J. Walsh, have examined conditions along the Schuylkill River and submitted a report to Dr. A. H. Stewart, State Secretary of Health, which the State is now considering.

Greater consideration is being given to the solids entering creeks and rivers from whatever sources—mines, industries, or sewers—and while the question has not been raised to any extent in the bituminous region, the studies made will affect that region because laws directed at the mines must be general in order to be constitutional. Hence, they will affect both bituminous and anthracite operations.

At the banquet, Harry M. Moses, president, H. C. Frick Coke Co., was toastmaster; John W. Haddock, vice president, Sullivan Machinery Co., said that operators must press for priorities on the materials needed for the manufacture of mining equipment because, while the coal industry is recognized as a war necessity, the supplier is regarded as important to the prosecution of the war only so long as essential industry needs and clamors for the supplies he can furnish and for the provision of basic materials out of which supplies can be manufactured.

Don't damage cars, especially when using crowbars to remove frozen material; keep cars moving; accept such cars as will serve the purpose even if not of the capacity desired and send only clean coal to market, declared Lieut. Col. Dawes E. Brisbane, Transportation Corps, U. S. Army, adding that the shortage of railroad cars and locomotives is an important bottleneck in the war.

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Personal Notes

I. N. Bayless, general manager, Union Pacific Coal Co., Rock Springs, Wyo., has been reappointed by the American Institute of Mining and Metallurgical Engineers as alternate representative on the Mining Standardization Correlating Committee of the American Standards Association.

G. E. Cleaver, superintendent, Glen Burn colliery, Susquehanna Collieries Co., Shamokin, Pa., has been transferred to Nanticoke as superintendent of No. 7 colliery, vice W. W. Williams, retired because of ill health.

E. G. Erdman has been appointed superintendent of Glen Burn colliery, Susquehanna Collieries Co., Shamokin, Pa., vice G. E. Cleaver, transferred.

Dr. Arno C. Fieldner, chief, Fuels and Explosives Service, U. S. Bureau of Mines, received on Dec. 2 in New York City the Melchett medal, awarded by the Institute of Fuel, of England, for outstanding achievement in work involving the scientific preparation and use of fuel. Ordinarily the medal is presented personally to the recipient in London, England, in October, but under present conditions the Council of the institute arranged the ceremony in this country, the presentation being made by a son of the president of the institute. Dr. Fieldner is the second American so honored with the medal since it was instituted in 1930.

S. A. Fox has been promoted from chief electrician at the Fork Ridge (Tennessee) mine to superintendent of the Crown mine of the Blue Diamond Coal Co., Chevrolet, Harlan County, Ky.

Walter B. Greene has been appointed mine inspector for mines of the Blue Diamond Coal Co. in Tennessee, Virginia and Kentucky.

A. H. Harvey, assistant mining engineer, No. 7 colliery, Susquehanna Collieries Co., Nanticoke, Pa., has been appointed mining engineer at Glen Lyon colliery, Glen Lyon, Pa., vice E. T. Powell, transferred.

Henry Horner, mine foreman for the

Consolidation Coal Co., Jenkins Ky., resigned Dec. 1 to take a similar position with the West Virginia Coal & Coke Corp., Omar, W. Va.

M. D. KIRK, vice president, Vesta Coal Co., Pittsburgh, Pa., has been designated by the American Institute of Mining and Metallurgical Engineers as alternate representative on the Mining Standardization Correlating Committee of the American Standards Association.

WALTER LONGMAN, formerly electrician, has been appointed superintendent of the Seymour Coal Mining Corp., Herrin, Ill.

JOHN MAYHEW, formerly superintendent of Crown mine, Chevrolet, Ky., has been transferred to Blue Diamond, Perry County, Ky., as superintendent of the Blue Diamond mine of the Blue Diamond Coal Co.

P. R. PAULICK has taken over active production management of the Akron Coal Co., Cambridge, Ohio, as general superintendent, effective Dec. 1. He will continue his consulting practice, however.

R. B. PERRY, of Sayreton, has been appointed by Gov. Frank M. Dixon of Alabama a member of the State Board of Mine Examiners. Mr. Perry is superintendent of coal mines for Republic Steel Corp. at Sayreton. He succeeds T. B. Dryer, resigned.

T. T. POWELL, mining engineer, Glen Lyon colliery, Susquehanna Collieries Co., Glen Lyon, Pa., has been transferred to Nanticoke as mining engineer at No. 7 colliery.

EDMUND A. STARLING, formerly district inspector, Kentucky Department of Mines, has been appointed labor conciliator for mines of the Blue Diamond Coal Co. in Tennessee, Virginia and Kentucky.

C. K. TIECHE, formerly superintendent, Monarch and Imperial mines of the Blue Diamond Coal Co., Lenona Mines, Lee County, Va,. has been appointed general manager of the Benedict Coal Corp., St. Charles, Va., vice CHARLES E. RALSTON, retired.

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Government Directory Issued

The Office of War Information, Washington, D. C., through its Division of Public Inquiries, has prepared and published the U. S. Government Manual, a directory of the Federal Government. The Manual, however, is more than a directory. It is a comprehensive ready reference handbook. Its 700 pages detail the legislative powers, functions, location, and names and titles of chief officials of all of the government departments and agencies. It also contains organization charts, a list of current federal publications, and a section on "abolished and transferred agencies and functions." It is fully indexed both by subject and personnel.

The fall-winter, 1942, edition of the Manual is available from the U. S. Information Center or the Superintendent of Documents, Washington, D. C., for $1.00, either in money order or check.

Degasifying Coal and Metals in Mining Debated at Central Appalachian Meet

How Coal Seams May Be Degasified by Horizontal Drilling and Gas Yields—New Hydrocarbons and Their Production—Factors in Metal Corrosion and How to Check It—Ferro-Alloys—Welding Technique

DEGASIFICATION of virgin coal to reduce mining cost and recover the gas by vertical shafts and horizontal drillholes into the seam was a major topic at the Huntington (W. Va.) meeting of the Central Appalachian Section, American Institute of Mining and Metallurgical Engineers, Nov. 20 and 21. Other subjects included metal utilization, corrosion, ferro-alloys (their uses and welding of the low type) and hydrocarbons in relation to the war effort.

This meeting, under the wing of retiring Section Chairman Robert H. Morris, manager, Gauley Mountain Coal Co., Ansted, W. Va., was planned largely by a local committee headed by D. P. Morton, chief rating commissioner, Chesapeake & Ohio Ry., Huntington. A cocktail hour was financed by the Jeffrey Mfg. Co., and the following firms or organizations contributed the floor show: American Car & Foundry Co., Banks-Miller Supply Co., du Pont, Goodman Mfg. Co., Huntington Chamber of Commerce, Standard Ultramarine Co., Westinghouse Electric & Mfg. Co. and West Virginia Rail Co.

Dr. Paul H. Price, West Virginia State Geologist, at the banquet, at which Dr. C. E. Lawall, president of West Virginia University, was toastmaster, outlined the latest facts on the natural resources of the State and their development. At a business session 40 new members, an increase from 215 to 255, were reported. A first assessment of $1 per member for the section, established Oct. 17, 1940, was voted to finance awards for student papers. The time limit for papers originally due June 31, 1942, was extended to Dec. 31, 1942. New members for the section executive committee were elected.

Chairmen of the technical session on Friday were Veleair C. Smith, consulting engineer, Charleston, W. Va., and N. C. Britz, research metallurgist, International Nickel Co.; on Saturday, Julian E. Tobey, managing director, Coal Bureau, Upper Monongahela Association, and E. A. Munvan, consulting petroleum gas engineer, United Fuel Gas Co., Charleston.

Would Take Gas From Coal

Degasification prospects, contended Leo Ranney, petroleum engineer, Columbus, Ohio, might be judged from outpourings of 3,000,000 to 8,000,000 cu.ft. of methane per 24 hours from some mines. "On days of low barometer, one mine delivers to the surface 8,000,000 cu.ft. per day, worth some $900." Degasification also would eliminate the possibility of costly mine explosions. Gas wells have been drilled into the Pittsburgh seam in southwestern Pennsylvania and the best well produced from the 8-ft. seam a total of 48,860,000 cu.ft. of methane during the first seven months.

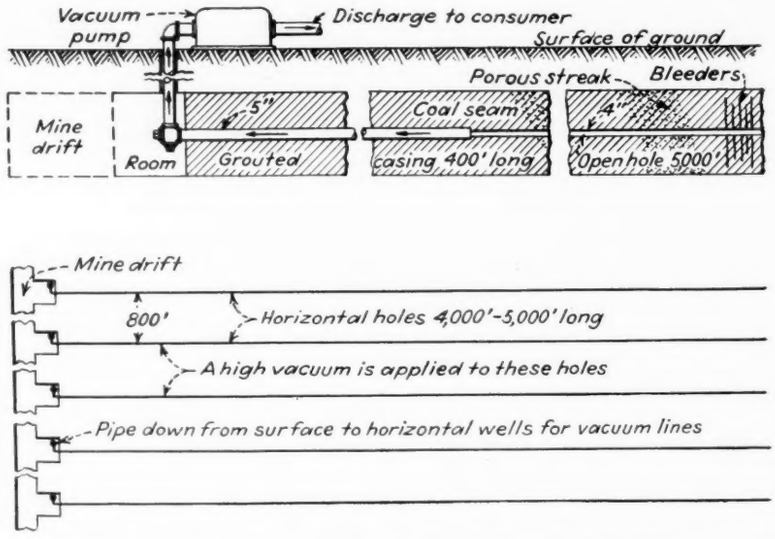
For over forty years, said Mr. Ranney, farmers in southeastern Ohio have drilled wells, most of them approximately 400 ft. deep, into a coal seam to get gas for heating, lighting and cooking. Many of the holes had an initial capacity of 50,000 cu.ft. per day and after 30 years some wells that extend only 1 ft. into the top of the coal seam still produce 10,000 cu.ft. per day.

Mr. Ranney stated that the technique of core-drilling horizontal holes "3,000, 4,000 and 5,000 ft. long" to follow the contour of the seam has been mastered and the use of a new rod puller to drill two wells at the same time in opposite directions was demonstrated in drilling six horizontal holes from a shaft in Ohio in the First Cow Run sand. While at present he considers 3,000 to 5,000 ft. as the practical limit of hole length in an oil sand, he thinks that in coal, because of lower friction, 5,000-ft. holes offer no power difficulties.

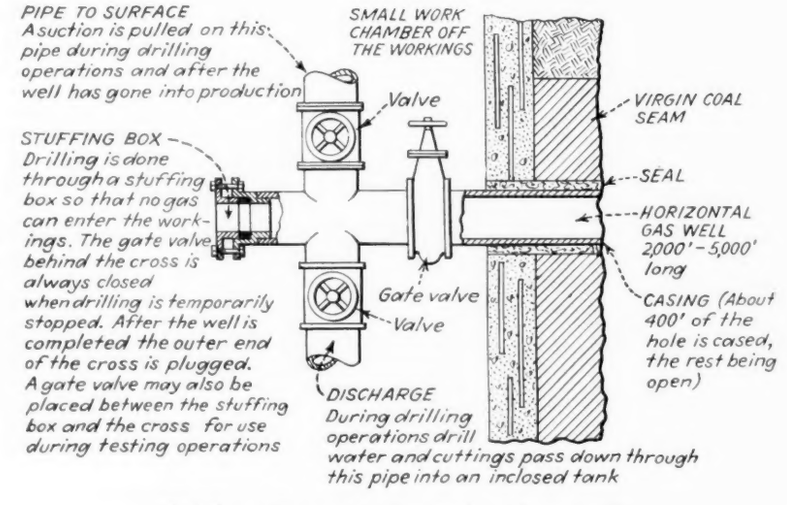
In calculating some possible productions from a shaft into the coal with horizontal holes radiating from its bottom, he assumed the use of a vacuum and pulling the gas through as much as 400 ft. of coal. Thus a single horizontal hole 4,000 ft. long would drain gas from 80 acres and in most gascous seams the production would be 1,500,000,000 cu.ft. from each horizontal hole.

In discussion, Mr. Morris told of gas from a core-prospecting drillhole furnishing fuel for a boiler used in sinking a shaft in southern Ohio. E. R. Price, superintendent, Inland Steel Co., Wheelwright, Ky., mentioned southern West Virginia operators were of the opinion that coal production cost could be cut 10c. to as much as 35c. per ton if the seam could first be rid of 75 percent of the methane.

G. E. Hoover, assistant to the engineer of coal properties, C. & O. Ry., com-



Sectional view and plan arrangement, Ranney method of degasifying coal seams. Well spacing depends upon coal permeability



Details at the mouth of a horizontal gas well.

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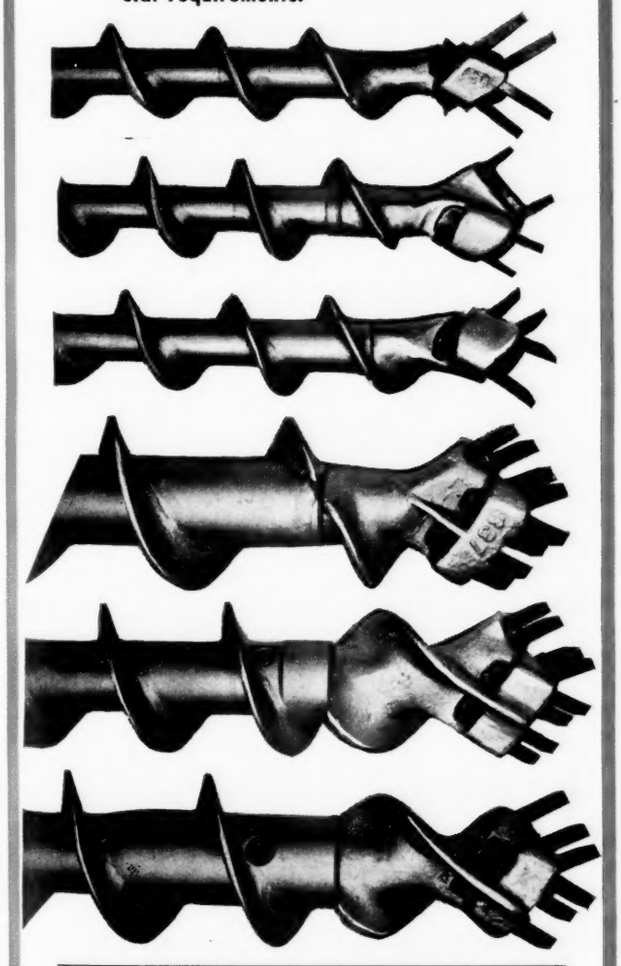
COALMASTER MATCHED TOOLS are available for holes from 1-½" to 16" diameter for all powder, CARDOX, AIRDOX, Hydraulic, and special requirements.



DO A BETTER AND FASTER DRILLING JOB

without increasing the load on the drilling machine . . .

★Most operators are confronted with the acute problem of inexperienced labor. And this just at a time when the demand for production is greatest. COALMASTER MATCHED TOOLS help in licking this problem because they are faster, more trouble-proof and will help the inexperienced driller to do better and faster work. They run more smoothly—clean holes cleaner—put less load on the drills and motors. Of course, they offer these advantages to the experienced drillers, too.

Use our Representatives

These men are drilling specialists—all ready to serve you. Consult with them about use and maintenance of these tools and about any drilling problem you are faced with. If they don't know, they can find out for you.

COALMASTER TOOLS
ARE IN USE ACROSS THE COUNTRY

CENTRAL MINE EQUIPMENT CO.
ST. LOUIS, MO.
"The Drill Bit People"

mented that there is little information on the gas pressures existing in the coal. In southern West Virginia it is known only that the pressure is somewhere over 30 lb. per square inch but less than the 250-lb. hydrostatic pressure existing at the bottom of holes drilled through water-bearing strata above the coal.

That the horizontal drillholes could afford a log of conditions and elevations that would aid the operator in developing the mine was suggested by Mr. Morton. Replying to a question as to the ability to follow quick changes in seam grades, Mr. Ranney stated that even if the hole were above the coal or below for a distance of 10 ft. or as much as 100 that would mean but little loss because the gas will travel farther than that in the coal. By taking a core continuously, holes entering the fireclay below the coal or the slate above are spotted and the direction of drilling is quickly corrected.

Permeability of the coal to allow passage of gas bothered several. B. H. Mott, president, Mott Core Drilling Co., offered the comment that his company has drilled many horizontal holes in coal and found little or no gas in the coal unless fissures were encountered. These they locate and seal off.

Not All Gas Comes From Coal

Dr. Price opined that quantities of gas may come from above or below the coal and that great quantities may come from gas "sorbed" in the coal itself. The latter will not be given up unless there is a permeability. Holes parallel to cleats might not produce much gas as compared to those at right angles. He also mentioned that considerable of the gas in some mines comes from methane-producing bacteria.

Hydrocarbons for the war effort and their production from coal tar, petroleum and natural gas were covered in a paper by John S. Pfarr, technical director, and R. A. Whealy, chief chemist, Ashland Oil Co., Ashland, Ky., read by Mr. Whealy. Explosives, motor fuels, synthetic rubber and anti-freeze are the principal demands which have revolutionized the production of hydrocarbons. While toluene for explosives, one of the family of aromatic hydrocarbons, was up to World War I produced from petroleum it is now being produced to capacity from coal tar.

The demand for benzene and the push for producing large quantities of fuel of the highest possible octane rating for airplanes has caused shifts in the utilization of raw materials. Alcohol for synthetic rubber is to come first from grain and then from natural gas of the Southwest.

As compared to natural rubber, the merits of Buna S are lower oil solvency and better abrasion resistance. Its disadvantages are lack of stickiness, unfavorable vulcanizing characteristics and one-third slower snap back to normal position, thus generating more heat. The heating can be counteracted to some extent by use of nylon, which is stronger than cotton and allows thinner walls. This synthetic rubber will not make good tubes.

Color and the fineness of grain of rust films on steels indicate the corrosion-resisting qualities and the fine-grain rust films can be very protective, said F. L. LaQue, development and research division, International Nickel Co., in his paper, "Some Questions and Answers on Corrosion." He defined corrosion as destructive alteration of a metal or alloy from contact with a liquid medium and demonstrated the electrochemical theory which explains practically all corrosion phenomena. There is a flow of electricity between anodic and cathodic areas on a single metallic surface or between dissimilar metals. The anodic reaction is an oxidation and the cathodic a reduction.

Because a metal to corrode must be wet by a solution to permit a passage of current there will be no corrosion if the metal is kept perfectly dry. Also, corrosion will be avoided by films of oil or paint coatings which will exclude conducting liquids. In most corrosion, by unavoidable contact with an electrolyte, hydrogen ions are discharged and the concentration of those ions in the solution (acidity denoted by pH) is a most important factor in speed of corrosion. With ordinary steel or iron the dividing line between rapid corrosion in acid solutions (low pH) and slow corrosion in nearly neutral or alkaline solutions (high pH) is about pH 4.5.

SECTION OFFICERS

Officers for the coming year named at the Huntington (W. Va.) meeting of the Central Appalachian Section, American Institute of Mining and Metallurgical Engineers, Nov. 20 and 21, are as follows:

Chairman, L. I. Cothern, professor of mining engineering, Virginia Polytechnic Institute, Blacksburg, Va.; vice chairman: E. R. Price, superintendent, Inland Steel Co., Wheelwright, Ky.; George E. Keller, manager, Commercial Testing & Engineering Co., Charleston, W. Va., and Thomas H. Clagett, superintendent and chief engineer, Pocahontas Land Corporation, Bluefield, W. Va.; secretary-treasurer, G. R. Spindler, extension director, West Virginia University, Morgantown, W. Va. The men named, together with the following, comprise the executive committee: Julian E. Tobey, managing director, Coal Bureau of Upper Monongahela Association, Fairmont, W. Va.; Herbert Husband, South Shore, Ky.; D. P. Morton, chief rating commissioner, C. & O. Ry., Huntington, W. Va.; Fred K. Prosser, coal traffic manager, N. & W. Ry., Roanoke, Va.; R. R. Estill, assistant general superintendent, United States Coal & Coke Co., Lynch, Ky., and Robert H. Morris, general manager, Gauley Mountain Coal Co., Ansted, W. Va.

Other factors affecting corrosion to varying degrees with different metals and conducting solutions are the dissolved oxygen content of the solution, temperature, agitation and the protective quality of the corrosion film itself. For instance, the corrosion rate of mild steel in 6-percent sulphuric acid free of oxygen is increased from 1,700 to 20,000 by saturating the acid with oxygen. In some metals, such as stainless steel, where the oxide films are the protectors, it is necessary that oxygen get to all surfaces of the metal. Thus, welded joints in stainless steel are preferable to the riveted or bolted types, which afford narrow cracks or crevices. These several factors show why in mine service under combined abrasion and corrosion there may be a wide variance in performance of metals. As a whole, however, alloy steels have demonstrated a considerable advantage over carbon steel.

Galvanic corrosion (one metal in electrical contact with another and in the same electrolyte) usually results in a higher rate of solution of the less noble metal and protection of the more noble. Steps suggested to minimize the corrosion are: (1) Insulate the two materials by such methods as spraying Thiokol on the flange of a steel pipe before joining it to a steel casting; (2) avoid agitation and aeration, especially in the vicinity of the more noble material; (3) have area of less noble metal large compared to the more noble; (4) use materials that are close together in the galvanic series; (5) use inhibitors; (6) paint in some cases and then on the more noble metal, and (7) introduce cathodic protection such as zinc plates or blocks.

Ferric Sulphate Culprit

Mine waters present a complex problem because of the wide variation in quantities of free acid, ferric sulphate and other constituents. The author set forth a few generalizations as follows: Ordinary iron and steels are likely to corrode rapidly even in mildly acid waters if ferric sulphate is present; "Ni-Resist" cast iron (14 percent nickel, 6 percent copper salts; bronzes are the next step be substituted for ordinary cast iron in any mine water and for bronzes in moderately corrosive waters containing ferric salts but not in waters containing copper salts; bronzes are the next step and where the mine water is so bad as to cause severe corrosion of these, stainless steels are likely to be a profitable substitution. These range from the straight alloys containing 25 to 30 percent chromium, perhaps with additions of nickel up to 12 percent, and on to complex compositions containing molybdenum and other elements.

Reduction of weight of transportation machinery, resistance to abrasion and the characteristic of deep quenching for hardening were mentioned as the principal applications in a paper, "Ferro Alloys and Their Uses," by R. C. Good, metallurgical engineer, Electro Metallurgical Co. Among the numerous good properties of iron is its ability to dissolve other elements which improve the characteristics. He used slides to present tables and illustra-

Julian E. Tobey and E. A. Munyan, chairman and co-chairman.

R. C. Good, Electro-Metallurgical, gives forth while Veleair Smith notes proceedings.

R. H. Morris opens up; at his right, G. R. Spindler, West Virginia University.

Paul H. Price, West Virginia State Geologist, takes turn at mike.

D. P. Norton, Chesapeake & Ohio Ry., on the rostrum.

Leo Ranney contends for degasification by drilling.

F. L. LaQue holds forth on corrosion.

R. A. Whealy discusses hydrocarbons from coal tar.

At the head table—L. I. Cothern speaking.

After the eats—section members and ladies lend an ear.

R. H. Morris (left), Gauley Mountain Coal Co., gives heed while C. E. Lawall, president, West Virginia University, makes a point.

In the meeting hall, with E. R. Price, Inland Steel Co., on his feet.

tions of quenching speeds for various alloys.

That arc welds should be annealed was illustrated by slides used by H. L. Miller, metallurgical engineer, Republic Steel Co., in a paper, "Welding Alloy Steels." He briefly mentioned the cracking difficulties when welding high alloys, then proceeded to show that low alloys can be welded to equal or exceed the original strength of the material and thus save as much as 46 percent in weight as compared to cast steel. For best strength, annealing should be done at between 1,100 and 1,200 deg. F. for 3 to 6 hours and the cooling to 500 deg. carried on in the furnace.

Welding depends more on the individual than any other operation, with hand forging a possible exception, and often it is easier to train new workers than re-train those who have had long experience in welding plain steels. Use of electrodes with the alloy in the rod itself or with the alloying material in the coating, holding a close arc, using a high current and moving fast are prime requirements for the best job on low-alloy steels.

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Scholarship Miner Graduated With High Honors

Andrew Rostosky, Pittsburgh Coal Co. scholarship student in coal-mine engineering, was graduated Dec. 17 with high honors at Pennsylvania State College, State College, Pa. He was elected a John W. White fellow, the highest honor of this kind that can be conferred on a graduating senior. This award carries a stipend of $600 for specialized graduate study at any American college.

Mr. Rostosky has had eight years of practical experience in and about the mines of the Pittsburgh Coal Co. His record justifies the faith of company officials in their belief that there are young mine workers or sons of miners who are technically inclined and capable of pursuing a technical course in mining engineering. His extracurricular activities included the presidency of the Mineral Industries Society, the student chapter of the American Institute of Mining and Metallurgical Engineers. He comes of a coal-mining family and has been a member of the United Mine Workers local at Library, Pa., since starting work in the mines.

Andrew Rostosky Jr.

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Ohio Power Co. Buys Hanna Coal Lands

The Ohio Power Co. has acquired 4,500 acres of coal lands in Wells, Cross Creek and Steubenville townships, Jefferson County, Ohio, for $1,076,000, according to deeds filed Dec. 10. These undeveloped properties were bought from the M. A. Hanna Co., Cleveland, and its subsidiary, the United States Coal Co. The power company is said to have acquired the coal land as insurance for the post-war period, when a new power plant is to be constructed at Brilliant, Ohio, held in abeyance by the War Production Board.

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27 Appointed to Mine Foremen Anthracite Examining Boards

Twenty-seven men have been appointed to the mine foremen examining boards and miners' examining boards in nine districts of the Pennsylvania anthracite field. The appointments, to remain in effect until Dec. 15, 1943, are:

District 8—Cord C. King, superintendent, Ewen colliery, Pennsylvania Coal Co.; Thomas Connone and Thomas J. Barry, miners.

District 9—Thomas R. Lewis, superintendent, Dial Rock Coal Co.; Benjamin Wilson and James Maloney.

District 10—James Dixon, superintendent, Pine Ridge colliery, Hudson Coal Co.; Thomas Thornton and Ray Powell.

District 11—W. L. Davis, superintendent, South Wilkes-Barre No. 5 colliery, Glen Alden Coal Co.; Edward Parry Jones and Charles Davis.

District 12—John R. Mould, superintendent, Woodward colliery, Glen Alden Coal Co.; William D. Roberts and Bernard Kline.

District 13—Thomas Gambold, superintendent, Huber colliery, Glen Alden Coal Co.; Timothy Brennan and Carl Lawson.

District 14—W. E. Weineck, superintendent, Glen Lyon colliery, Susquehanna Collieries Co.; Stanley Salva and Joseph Jones.

District 15—James Crabtree, superintendent, Eckley colliery, Jeddo-Highland Coal Co.; Morris Mensinger and Jacob Kushmider.

District 16—Sol Jenkins, general manager, Cranberry Improvement Co.; Bernard McAlarney and Thomas S. Davis.

These reappointments to miners' examining boards expire Dec. 15, 1944; George Kolar, Hazleton; Thomas J. McDonough, Pittston; Anthony Strish, Plymouth; Anthony Beeunas, Newport Township; Bernard McAlarney, Hazleton; Michael Yourishin, West Hazleton; John C. Thomas, Plymouth; Thomas F. Conway, Sugar Notch; John Garrahan, Plains Township.

Alfred M. Staehle,
new Coal Age publisher

Alfred M. Staehle Appointed Coal Age Publisher

Alfred M. Staehle has been appointed publisher of *Coal Age* and *Engineering and Mining Journal* by the McGraw-Hill Publishing Co., Inc., effective Jan. 1. He succeeds H. W. Clarke, resigned, and continues as vice president and publisher of *Factory Management and Maintenance* in addition to his new duties. A graduate of Carnegie Tech, Mr. Staehle was editor of *Coal Industry* before joining McGraw-Hill in 1926 with the mining catalogs. In 1929, he was appointed assistant sales manager for *Coal Age* and later became manager, which position he held until 1932, when he was made sales manager for the company's construction papers, shortly afterward taking the position of publisher for *Factory*.

•

Six Killed in Kentucky Blast

Six miners were killed while nine others trapped by an explosion on Nov. 30 in Mine No. 10 of the West Kentucky Coal Co., near Wheatcroft, Ky., were able to escape. The blast closed one entrance of the mine, in which 233 men were working.

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New Preparation Facilities

COMPANHIA SIDERURGICA NACIONAL, Tubarao, Santa Catarina, Brazil, South America—Contract closed with McNally-Pittsburg Mfg. Corp. for tipple and cleaning plant with capacity of 500 tons per hour; coal will be crushed to 1½ in. and washed in McNally-Norton automatic washer and McNally-Rheo units; three products to be loaded are 0x$\frac{5}{16}$-in. metallurgical coal, dehydrated in five McNally-Carpenter centrifugal dryers; 1½x$\frac{5}{16}$-in. or 0x1½-in.; water to be clarified in Dorr thickener and slurry to be recovered by disk filters; to be shipped about June 1, 1943.

GLEN ALDEN COAL CO., Woodward Colliery, Edwardsville, Pa. — Contract

closed with Menzies Separator Co. for two 7-ft. Menzies cones, one to clean egg and stove refuse and the other to clean nut refuse; total feed capacity, 140 tons per hour.

Green Top Coal Co., Jessup, Pa.—Contract closed with Menzies Separator Co. for one 4-ft. Menzies cone to clean pea coal and one 3-ft. Menzies cone to clean buckwheat; total feed capacity, 34 tons per hour.

Indian Head Coal Co., Tremont, Pa.—Contract closed with Finch Mfg. Co. for two 4-ft. Menzies cones, one to clean nut, pea and buckwheat refuse and the other to clean No. 5 buckwheat; total feed capacity, 44 tons per hour.

Moffat Coal Co., Taylor, Pa.—Contract closed with Menzies Separator Co. for one 7-ft. Menzies cone to clean egg, stove and nut refuse; feed capacity, 70 tons per hour.

Morgan Coal Co., Bryant, Ill.—Contract closed with McNally-Pittsburg Mfg. Corp., for one McNally-Vissac thermal dryer to treat 1¼x½-mm. coal at rate of 75 tons per hour; to be completed in May next.

Republic Steel Corp.—Contract closed with Fairmont Machinery Co. for Chance cleaning plant, including equipment to pick and crush the coal before it is discharged onto a rope-and-button conveyor 680 ft. long; the latter to transfer to a belt conveyor where the coal will be screened to ¼-in., with the plus ¼-in. being fed to a 12-ft.-diameter Chance cone for cleaning; the raw 0x¼-in. is to be mixed back with the clean coal after the latter has been dewatered on shaker screens; provision will be made for crushing reject from the Chance cone and recirculating it back through the cleaning unit.

•

New Lincoln Award Program For Engineering Students

The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio, announced on Dec. 1 its first award program in the field of undergraduate engineering study. The new project is the $6,750 annual engineering undergraduate award and scholarship program. Its object, as expressed in rules and conditions governing participation, is "to encourage engineering students to study arc-welded construction so that their imagination, ability and vision may be given opportunity to extend knowledge of this method and thus aid the war effort and the economic reconstruction in the peace which is to follow."

There are 77 student awards—a first award of $1,000; second, $500; third, $250; four awards of $150, eight of $100, twelve of $50, and fifty of $25. There are seven scholarships of $250 each. The school of the first award winner will receive four scholarships totaling $1,000; the school of the second winner will receive two scholarships totaling $500; and the school of the third winner will receive one scholarship of $250.

Any resident engineering undergraduate student registered in any school, college or university in the United States giving a course in any branch of engineering or architecture leading to a degree, or any cadet registered in the U. S. Military Academy, U. S. Naval Academy or Coast Guard Academy is eligible to submit a paper in the award program.

The awards will be made for papers describing the conversion from other methods to arc-welded construction of parts of machines, complete machines, trusses, girders or structural parts. The subject may be something which the student has observed in school shops, magazines, books, printed matter or elsewhere; or he may conceive of a subject which has never been built but could be built by arc-welding.

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Stevens Breaker Burns

The newly equipped breaker of the Stevens Coal Co., at Trevorton, Pa., was destroyed by fire early in December. Rebuilt last July, the breaker's capacity was stated to be 2,500 tons daily. Later in the month, George H. Jones, general manager, stated that the plant would be rebuilt and enlarged, priorities having been granted for the materials required.

Charles F. Spencer

Charles F. Spencer Dies

Charles F. Spencer, 69, president, Pittsburg & Midway Coal Mining Co., Pittsburg, Kan., died Dec. 1 after a short illness. Born into a family which had long been interested in the coal business, he started as a bookkeeper with the Columbus Coal Co., headed by his father, becoming treasurer, then general manager and ultimately president. In 1911 he purchased controlling interest in the Pittsburg & Midway company, which has since become one of the largest strip-mining companies in the Middle West, with operations in Kansas, Missouri and Illinois.

His many activities included two terms as president of the Southwestern Interstate Coal Operators' Association; a director of the National Coal Association for 20 years; second president, Kansas Associated Industries; national councilor, U. S. Chamber of Commerce; a director of the National Bank of Pittsburg, United Iron Works and the Joplin-Pittsburg R.R. Co. He also was chairman of the board of the Military Chemical Works, of which his son Kenneth A. Spencer is president.

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Residents Flee From Homes As Mine Caves in Pittston

A series of mine subsidences in Pittston, Pa., beginning on the night of Nov. 27 and recurring twice within the following three days caused houses to crack, streets to split open and settle and sent residents scurrying from their homes. Some of the fissures were as much as 5 ft. wide and 150 ft. long, causing gas and water mains to snap in places.

The first disturbance caused subsidence of 2 to 2½ ft., but later settlings were as great as 6 ft. Train service, especially on the Laurel Line, was disarranged and the Garfield grade school was closed as unsafe. A representative of the Pagnotti Enterprises, which operates collieries extending under the city, said he understood the anthracite seam under the affected area had not been operated since 1868.

James Reber, tipple maintenance foreman, Piney Fork No. 1 mine, Hanna Coal Co., Piney Fork, Ohio.

James D. Ireland, superintendent, Piney Fork No. 1 mine, Hanna Coal Co., Piney Fork, Ohio.

J. W. Whelan, general outside supt., Piney Fork No. 1 mine, Hanna Coal Co., Piney Fork, Ohio.

Bert Simonson, superintendent of machinery, Hanna Coal Co., Piney Fork, Ohio

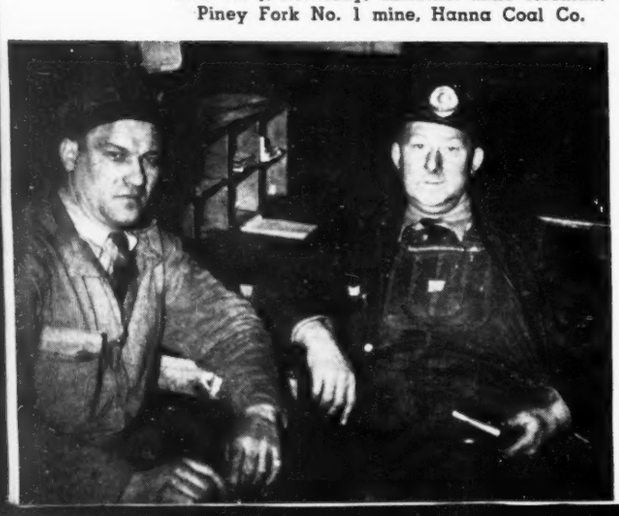
Coal Men on the Job

William Roy Jr. (left), compensation director, Hanna Coal Co., St. Clairsville, Ohio, and C. Russell Thompson, workmen's compensation division, Ohio Coal Association, Cleveland.

Supervisers, 4 p. m. shift, Piney Fork No. 1 mine, Hanna Coal Co., Piney Fork, Ohio. Back row, left to right: Harry Hill, Charles Cross, Joe Sabo, George Luke. Front row: Andrew Stanko, Charlie Adamson, Albert Bednar. Mr. Sabo is shift foreman; the others are section foremen.

Lawrence Jeffers, foreman, general shop, Hanna Coal Co., Piney Fork, Ohio

Okey Howard (right), general mine foreman, and W. J. Bernosky, assistant mine foreman, Piney Fork No. 1 mine, Hanna Coal Co.



Supervisers, 8 a. m. shift, Piney Fork No. 1 mine, Hanna Coal Co., Piney Fork, Ohio. Back row, left to right: J. W. Watkins, James Curtis, Stanley Someroski, Pete Boruta. Front row: Robert Roush, Donald Riley, Floyd Campbell. Robert Roush is maintenance foreman and the others are section foremen.

by Editors on the Job

C. E. Barding, supt., Schuyler Coal Co., Rushville, Ill.

Karl Meyer, coal analyst, Nason mine, Consolidated Coal Co., Nason, Ill.

Andy McMurtry, chief electrician, Mine No. 1, Bell & Zoller Coal & Mining Co., with Lyle Smith and George Dawson.

Bob Beach, veteran armature winder, Orient No. 1, Chicago, Wilmington & Franklin Coal Co.

Senator Charles F. Carpentier, chairman, Illinois Strip Mining Commission; Wm. H. Stewart, general superintendent, Sherwood-Templeton Coal Co.; Representative Elmer A. Hitter, member, Strip Mining Commission; H. A. Reid, general manager, United Electric Coal Cos.; Thomas Latimer, engineering dept., United Electric.

C. D. Reed (left), president, and B. F. Read (right), secretary-treasurer, Turner Elkhorn Mining Co., Liberty Elkhorn Mining Co., Sampson Elkhorn Coal Co. and Kathryn Elkhorn Coal Co., Drift, Ky. W. L. Reed (standing), son of C. P. Reed, is superintendent, Turner A mine, Kathryn Elkhorn Coal Co.

Senator R. G. Crisenberry, member, Illinois Strip Mining Commission; Paul Seastrom, forester, United Electric Coal Cos.; Lowell Malan, chemist, United Electric Coal Cos.; William Mowers, chief clerk, Southwestern Illinois Coal Corp.

W. M. Wallen, chief engineer (standing); Fred L. Sherman, superintendent, Thealka mine, and R. C. Thomas, general superintendent, Thealka and Auxier mines, North-East Coal Co., Thealka, Ky.

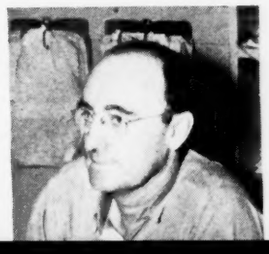
James W. Bristow, secretary, Illinois Coal Strippers' Association.

Charles Broach, member, Illinois Strip Mining Commission, and stripping shovel runner, United Electric Coal Cos.

Gilbert A. Cady, geologist, Illinois State Geological Survey.

J. P. Sammons, mine foreman, Liberty Elkhorn Coal Co., Langley, Ky.

J. S. Hampton, superintendent, Glogora Coal Co., Glo, Ky.



Harry LaViers, president, Princess Elkhorn Coal Co., and vice president and general manager, South-East Coal Co., Paintsville, Ky.

Ursell Maynard, assistant chief electrician; O. R. Copley, superintendent, and C. T. Sink, chief electrician, Carlston Coal Co., Kermit, W. Va.

U. P. to Start Development Of New Stansbury Mine

Work will begin soon on a 3,500-ft. tunnel of the Union Pacific Coal Co.'s new Stansbury mine, 2¼ miles northeast of Reliance, Wyo. The new operation is expected to produce 5,000 tons of coal per day when it reaches peak production. Eugene McAuliffe, president of the company, said the mine probably would not start producing until the fall of 1943, by which time it probably will employ 600 workers.

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Obituary

WILLIAM RUSSELL FLEMING, 46, who took over the management of the Robert Fleming & Co. coal mines, Banner, Va., soon after the death of his father, one of the pioneers in the coal industry in Wise County, Virginia, in 1924, died Dec. 19 at his home in Norton, Va., after an illness of two weeks. He also was secretary-treasurer of the Banner Coal Co. and the Fleming Land Co.

BENJAMIN H. PURSER, superintendent of the Colta Mines, Alabama By-Products Corp., Birmingham, Ala., died Nov. 24 at his home at Flat Creek, Ala., after a week's illness. Prior to becoming superintendent for Alabama By-Products three years ago he was superintendent of mines for the Consolidation Coal Co., of Kentucky, for 15 years. Born at Brookwood, Ala., he began with the Woodward Iron Co. at the age of 21.

J. E. SEYMOUR, 47, superintendent, Seymour Coal Mining Corp., Herrin, Ill., died Nov. 21 at his home in Benton, Ill., of a heart attack.

FLETCHER W. CUNNINGHAM, 69, of Somerset, Pa., dean of mine inspectors in the Keystone State, dropped dead from a stroke Nov. 24 as he entered the mine of the Lilly Benscreek Coal Co., Lilly, Pa., to make a routine inspection. He had been a mine inspector for forty years.

GEORGE KUHN CABELL, 70, general manager of operations, Carbon Fuel Co., died Dec. 12 of a heart attack in an ambulance en route to a Charleston (W. Va.) hospital. Formerly associated with his brother, Charles A. Cabell, in the coal business at Carbondale, W. Va., he joined the old Carbon Coal Co. in 1902. Several years later he became general store manager for the Carbon Fuel Co., being appointed general manager in 1935.

CLARENCE LOUIS MOSS, 57, president and treasurer, Moss & McCormack Coal Co. and Nauvoo Black Creek Coal Co., died Dec. 15 in Birmingham, Ala., after a short illness. He had been active in the coal mining industry practically his entire life since the age of 17.

ROBERT PEELE, 84, professor emeritus of mining at the Columbia University School of Mines, New York City, and editor of Peel's "Mining Engineers' Handbook," died Dec. 8 at his home in New York City.

Mining Men at Pittsburgh Plan Ways to Back War Effort and Cut Road Accident Rates

Expansible Mine Roof Can Be Destroyed by Moisture in Summer Air—Windsor Power House Co. Removes This Moisture Before the Current Enters the Mine—Streamliner Passenger Service for Face Workers

SAFETY on haulageways, mine inspection and war problems were all on the docket when the Coal Mining Institute of America held its 56th annual session in Pittsburgh, Pa., Dec. 10 and 11. One feature of haulageway safety was covered by an address on the protection of the roof by cooling the air with water before it enters the mine, which cooling is done by water which itself has been cooled by the return air from the cold mine. And how is this water obtained? By collecting the moisture from the precooling of the intake air, a rather perplexing though very effective merry-go-round and quite simple, foolproof and automatic. Another feature discussed was safe man-trips. These two features are physical, and therefore iron-clad, ways of assuring safety—dependent, therefore, on stable materials and not on unstable men. Three types of inspectors—federal, state and insurance inspectors—described their methods and purposes. Scrap collections, priorities and defense against the obtaining of explosives for sabotage also had their airing before this court of mine experts.

Success in the use of sprays at the Beech Bottom mine of the Windsor Power House Coal Co., to lower the temperature of the air entering the mine and in thus removing the moisture that would be deposited within the mine if it were left to the chilliness of mine workings to lower the temperature, was described by D. F. Welch, mining engineer, West Penn Power Co., Pittsburgh, Pa. In commenting on Mr. Welch's paper, H. P. Greenwald, superintendent, U. S. Bureau of Mines, Central Experiment Station, stated that operating men needed to know what effect the drying of a mine has on the condition of the roof. Also, it is clear that the roof picks up moisture when the air is supersaturated, but will it continue to do so measurably if the air is not allowed at any time to be oversaturated? Data are needed, he added, on the costs of repairs and of operation before and after the introduction of air conditioning.

Falls Costly to Operation

Cost of cleaning up falls is far larger than has been recognized, declared W. P. Vance, general superintendent, Butler Consolidated Coal Co., Wildwood, Pa., who acted as chairman. Installation costs to date have been $25,000, said Mr. Welch, which cost includes four 15-hp. motors, one for each pump. One reason for not completing the installation and making provision for winter warming as well as summer cooling was the difficulty in obtaining material and priorities. It took a year to get the equipment for the present incomplete installation. No decision has been made as to the way in which the air should be heated in the winter.

When it was suggested that a wetting agent might help the air to pick up water, Mr. Greenwald declared that a definite quantity of heat would be required to evaporate the water for air saturation no matter how that saturation was effected. If the protection of the roof is to be intrusted to gunite, two inches of that coating is needed, declared Mr. Welch, to prevent moisture and temperature from destroying the mine roof. The 1-in. coat already in place at Bottom Creek has broken in places as a result of these attacks. Why not take the air through old mine workings and thus free it of moisture in summer, moisten it in winter and condition its temperature at all times? asked J. W. Paul, consulting engineer, Pittsburgh, Pa.

J. J. Forbes, past president Coal Mining Institute

Reporting for the committee appointed to determine the need for a change in the limit that has been set for the quantity of explosive allowed in any one drillhole—the so-called charge limit—J. E. Tiffany, explosives division, U. S. Bureau of Mines, Pittsburgh, Pa., stated, for S. M. Cassidy, manager, Weirton Coal Co., Weirton, W. Va.; G. A. Schoomaker, general superintendent, Union Collieries Co., Renton, Pa.; W. J. Ivill, Pennsylvania State mine inspector, Monongahela, Pa., and himself, that the need for increasing this charge limit appeared to arise largely from the use of machinery for loading and from the increase in the depth of undercut.

Some operators declared themselves entirely satisfied with the present 1½-lb. charge limit per shot, but many operators said it should be increased to 2 lb. and even to 3½ lb. for a single hole, because in many instances 1½ lb. is not enough. Presence of dirty coal or many pyrite stringers and "black jack" (meaning, in this case, probably bony coal) may necessitate, in their view, the use of heavier charges. Others believed that it was advisable to increase the quantity of explosive where a larger charge was necessary to break the coal, but that each mine should be allowed to use only the quantity needed to accomplish that purpose. Other operators considered 1½ lb. sufficient to break the coal, but in rock work they were definitely of the opinion that the quantity should be increased.

Studies made in coal mines showed that when a deep cut was made in thick coal, many holes had to be drilled and fired if the permissible charge limit was not to be exceeded, and that, because of the nearness of the holes, shooting of first holes often spoiled the effect of later shots. When fewer and larger shots were used, the results obtained were more successful. So the committee advocated a heavier charge limit if the explosives certified for such heavier loading could be used safely in dry and dusty mines and suggested that the U. S. Bureau of Mines be requested to certify such explosives if they could be obtained. A motion being made on the proposal of Richard Maize, Secretary of Mines, Pennsylvania, Harrisburg, Pa., it was so ordered.

Not Good but Excel Others

In his annual address, J. J. Forbes, chief, Mineral Production Securities Division, said that the bituminous fatality rate probably would be found to have risen 3 percent and the anthracite fatality rate 4 percent in 1942, after necessary revisions have been made, an increase in the annual record much to be regretted but far less than that of industry in general. Production of bituminous coal had increased 16 percent and anthracite 9 percent. Some of the companies were paying men with phony German currency for days on which they were voluntarily absent, adding a note expressing the pleasure of Hitler and Hirohito with their inactivity on such days. Mine absenteeism had been estimated as 12 percent. With 200,000 men less than in 1918, it would be difficult in the future for the mines to maintain their output.

Mine inspection, said E. H. Denny, chief, coal-mine inspection division, U. S. Bureau of Mines, Pittsburgh, Pa., serves to correct bad practices and to discover and spread good ones, particularly those of an unusual nature which may merit adoption in other mines. In Pennsylvania, Ohio, northern West Virginia and Maryland, the coal-mine inspection force has 33 inspectors, 1 electrical engineer and 1 explosives engineer, all under the supervision of the Supervising Engineer, G. W. Grove. Inspectors are provided with permissible-type flame safety lamps and small E-2 methane testers accurate to about 0.2 percent methane and capable of determining quantities between 0.2 percent and the lower explosive limit, also vacuum bottles for use in taking samples to send to the Pittsburgh chemical laboratory for analysis, which can ascertain the quantity of methane present with an accuracy of 0.02 to 0.03 percent. Though air usually

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is measured by the Bureau with anemometers, the Pittsburgh office has pitot tubes and other devices for more accurate measurements.

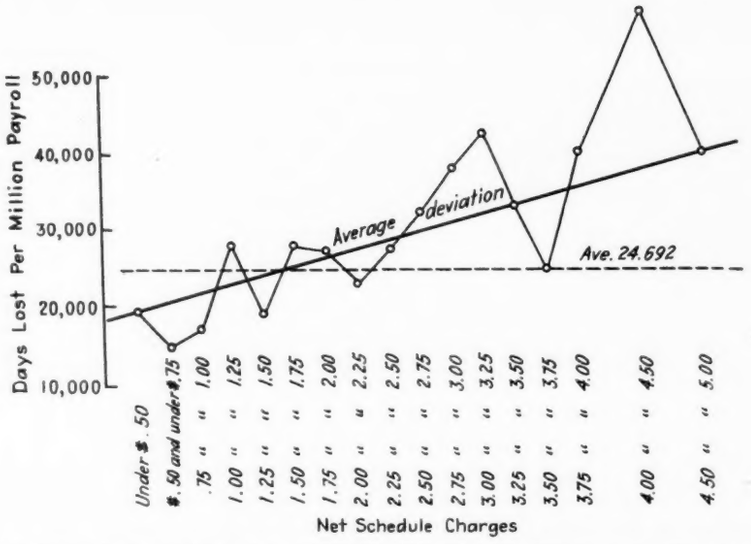
Inspectors are charged to discuss with the management and the State Inspection Department any dangerous conditions that immediately imperil a considerable number of men. Length of time required to inspect a mine may vary from two days, for a small wagon mine, to as much as six weeks in a mine operating on steep pitches, having a large working territory and employing over a thousand men. During the last three months, the time of inspection has averaged 9.4 days per mine. When special problems arise, the explosives and electrical engineers of the division and the engineers of the Safety Division are available for their further study and solution.

Inspections should be made in company with a mine official, preferably the mine foreman or superintendent, and questions arising should be discussed with him. Inspectors should take a ride on the man-trip if there is one, both in and out of the mine, and spend time with the night shift and fireboss, as the latter is likely to be informative of night operating practices and supervision and thoroughness of gas examinations.

Mine Unsafe, Page Operator

Because 90 percent of the legal requirements of the mining law are responsibilities binding on the operator, the inspector should make contact with the operator, declared Olen S. E. Conrad, Pennsylvania State mine inspector, California, Pa. "Many superintendents and mine foremen would be surprised to know the number of their problems that are solved in the inspector's office without any knowledge whatsoever on their part." With coal dust we must anticipate what four months of flying dust will add to the accumulation. "We do not agree that all bituminous mines must be rock-dusted. . . . The law of Pennsylvania delegates the right to the inspector of the district to classify a mine or portion of a mine as dry and dusty, also the right to require rock-dusting of that mine or portions if so classified."

Serious consideration is being given by the Pennsylvania Compensation Rating and Inspection Bureau, asserted C. E. Berner, superintendent, to crediting the use of plastic eyeshields in lieu of spectacle or cup-type goggles, with the expectation that they will be more readily usable. Use of gloves also is under consideration. Many gloves used by mine employees are not sufficiently durable to prevent cuts and bruises. In 1940 and 1941, in the insured bituminous mines of Pennsylvania there were 7,032 compensable injuries, including fatals and permanents. Out of this number, 1,090 were cuts or bruises of hand and fingers. In the same two years, there were 10,908 non-compensable injuries with about 2,750 occurring to hand or fingers. This constitutes 15.5 percent of compensable and 25.2 percent of non-compensable injuries. Few of these injuries are serious, but they often result in infection and occasionally in loss of hand, arm or even life. This type of injury cost $127,708 in the two years, or 4.7 percent of the total compensation and medical costs.



Charts shows how regularly the record of days lost per million of payroll rises with net schedule charges for insurance, thus indicating the general adequacy of the methods pursued in rating mines.

About a third of the Pennsylvania bituminous mines and 15 to 20 percent of the anthracite mines are insured subject to the rating of the bureau. Rates are based on both schedule rating, which measures the physical hazard, and experience rating, which reflects the moral risk. By considering the actual losses of the operator for the last three years and using these to modify the schedule rating, a fairer rate is obtained than by either taken alone. The accompanying chart correlates rate charges developed by inspections with the loss experience. Because rate of pay during the years 1938-1940 inclusive was uniform and as wage rates are designed so that a dollar in thin coal represents the same work as in thick coal, it is thought the payroll is a definite basis for measurement, though man-hours would be better if they could be obtained.

It has been said, declared W. P. Vance, superintendent, Butler Consolidated Coal Co., Wildwood, Pa., that the coal industry never junked anything but kept it around, hoping some day it would serve some essential need. When the industry asked for priorities, it was questioned as to what it was doing with the scrap problem. Some companies are giving a ton of scrap for every ton of finished product. Some are telling their men to bring out some scrap from the mine every day, and some have put a man in charge of collection of scrap, and he does nothing else but hunt it and see that it is brought out.

Record at Washington, said H. H. Egglestone, chief, mining unit, Industrial Salvage Branch, Conservation Division, Washington, D. C., shows that 161,000 tons of iron and steel scrap, 3,250,000 lb. of copper and 4,000,000 lb. of other non-ferrous metal scrap have been brought out by the scrap collection from coal mines. This is not the complete figure. Perhaps 200,000 tons of iron and steel was contributed if all were recorded. He was not going to tell coal men how to get scrap but some had appointed a top executive to have general charge of collection and some a man to undertake the work actively in detail. During World War No. 1, only 94 lb. of steel and other metals was needed per man, but in this World War No. 2, it is estimated that 4,900 lb., or about 50 times as much metal, will be needed. Industry has already cleaned out the cream of the scrap pile; from now on it will have to dig for all it obtains, said Mr. Forbes, and it will have a hard time to find it. Mine inspectors, said Richard Maize, have been told to report on the scrap available at idle mines.

Promotion of safety in handling explosives, declared R. D. Leitch, chief, Explosives Control Division, U. S. Bureau of Mines, although comparatively a secondary benefit, is one of the purposes of the act. It provides for five types of licenses: (1) a manufacturer's license, (2) a vendor's license, (3) a purchaser's license, (4) a foreman's license, authorizing purchase, possession of explosives and explosive ingredients and the sale and issuance thereof to employees of the licensee's employer for use on the operating premises only, but an employee may not be licensed as a foreman unless his employer is first licensed under the act. An employee holding a foreman's license need not be a foreman in fact; that is, need not be in control of a labor crew. (5) An analyst's, educator's, inventor's and investigator's license.

In general, instructions require storage of 50 lb. or less of explosives in a strongly constructed wood box at least 2 in. thick, covered on the outside with sheet iron not lighter than 14 gage and provided with strong hinges, hasps, staples and locks, painted red or other distinctive color, and clearly marked "Explosives." The box-type magazines must be as specified or such as are declared by an authorized representative of the U. S. Bureau of Mines to be equal to those specified. They may be used for the storage of not less than 5,000 detonators, but explosives and detonators must be stored in separate magazines. Search of employees leaving

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**On November 16 a mine in Kentucky informed us they had a broken crankshaft on their hoist. A new crankshaft was made, installed and they were back in operation in six days. (Name of mine on request.)*

ROBERT HOLMES AND BROS.

BINS - GATES - LOWERING SPIRALS - DUST-O-LATORS - SHAKING GATES

DANVILLE, ILLINOIS

the mines may be required as a further means of preventing diversion of explosives to improper or less proper uses.

A superintendent, explained Mr. Leitch, can have keys to magazines and all the latter can be arranged to be opened by a master key. Some leeway in the regulations is needed, said Richard Maize, where there are only ten men in a mine. The 2-in. box is too heavy to take into a pitching breast, declared P. J. Friel, Pennsylvania State mine inspector, Shamokin, Pa., who said 1 in. was desirable. The Bureau of Mines and the Philadelphia & Reading Coal & Iron Co. had separately determined that, with a 1-in. box, explosives and detonators could be stored together with safety if a 2-in. wood wall separated them but had agreed as a factor of safety on a 3-in. wood wall. Mr. Leitch said he was unwilling to insist on a 2-in. box where a 1-in. box was already in use.

The miners and the union opposed the searching of men for explosives, said Mr. Friel, to which Mr. Leitch replied that if the U. S. Explosives Control Division could not effect it, the U. S. Army might be expected to undertake it, for its officers were already clamoring for such action. Pennsylvania State inspectors have been told to ask if the men are being searched and to report accordingly, but they have been told to require in this and in the matter of handling of explosives that compliance be made with the State law and not to attempt to urge compliance with any regulations that contravene that law.

In answer to Mr. Tiffany, Mr. Leitch said rubberized bags are approved but not demanded, as rubber is too scarce. Men are required to prepare the face first and then take thereto enough explosive for one complete charge, said Mr. Leitch. It was argued by some present that this rule was undesirable with single-shot shooting because it was not clear how much explosive would be needed, for the charge with later shots would depend on the execution wrought by earlier ones. In the opinion of Richard Maize, the new regulations seemed aimed more at safety than at sabotage.

Labor-Management Groups

In an address discussing absenteeism, B. W. Derringer, production manager, Central Pennsylvania Bituminous Coal Producers' Association, Altoona, Pa., said that at first the miners thought the labor-management committees were an indirect approach to a "speed-up" and the operators feared them as a ruse to give the miners a chance to take a hand in the management, but both are working together now to support the war effort. These committees are not new. They originated with the Baltimore & Ohio R.R. and later were adopted by the Canadian National Rys. The C.P.B.C.P.A. is the only organization that has taken up the idea intensively.

Men working in a 36-in. seam of coal find it difficult to work day after day in such a thin bed, declared E. C. Curtis, Pennsylvania State mine inspector, Kingston, Pa. Average age of men in low places today is 7½ years greater than of the men who, before the war, used to do such work. That accounts for some absenteeism. Men often are reported as absent for some time after they have left their jobs, perhaps for war work. Some men stay at home merely to take a last day or so of fatherly association with their inducted sons and are labeled as unpatriotic absentees. Absenteeism has been stressed sometimes unduly.

W. P. Vance, who succeeds Forbes as president

High wages and regular working time have made absenteeism frequent, declared R. E. Charlier, personnel manager, Pittsburgh Coal Co., Pittsburgh, Pa. However, neither companies nor men had in the past a sense of their mutual obligation; the men to work regularly and for the full day and the company to supply work. What would the miner think if the employees of the transportation, merchandising, public utility and other industries on which he relies for the services surrounding his daily life held their obligations as lightly as he holds his. These industries expect their employees on the job every day and, if they cannot come, they must notify their supervisors or face dismissal. Penalties there are in the coal industry for absenteeism, but why then are they not invoked?

Ways of preventing absenteeism are: (1) paying for idle days in "phony" money; (2) listing absentees on a bulletin board; (3) giving gate prizes on each shift; (4) awarding steady workers with insignia or other awards; (4) displaying posters in plant or on bulletin board; (5) holding meetings and (6) forming production committees. There probably are more. In his conclusion, Mr. Charlier emphasized by an example the advantage of personal reference by the foreman at the working place to any absenteeism that had been noted the preceding day.

Operator Must Prove Case

The primary need of the industry to meet the insistent demand for greater tonnage is new equipment, but it needs in every several instance to prove its case for priority, declared D. L. McElroy, Technical Advisor for Coal Priorities, War Production Board, Washington, D. C. It is not enough to say merely that the new equipment is necessary for production, so the Board will ask first, before it will recommend that priorities be granted, whether it is essential for the proper operation of the mine. The need of the mine must be compared with the needs of industries which are competing for priorities. "Are the present facilities being used to a maximum?" is another question that must be answered, and "Have the engineering and managerial abilities been used exhaustively to find some way of doing without the material desired?" and also "Could any substitutions be made?" "Could second-hand equipment be found to take its place?" Such material is getting scarcer, but still can be found.

Some people have said they must have certain equipment and later withdrawn the application, saying they had now no labor to operate such equipment if they had it. Shifting machinery from one mine to another may meet the needs. To make the story convincing, let the man at the mine tell the story and then let the office rephrase it before sending it in. Project ratings for new mine openings are handled by the coal section and must show need before anything can be done. The trouble usually is to get due sequence in the delivery from suppliers. Priorities cannot be sought merely to get items that will not be needed until the project is well on its way. In seeking a PRP, the material available, the needs of the company, the mining system and market considerations will have to be presented. A final thought is: "If it won't help the war, forget it." Unfortunately, said Mr. Connor, who presided, we are likely to get in a quarter all that we have asked for a year.

"In one of our mines," declared Superintendent Snure, Rochester & Pittsburgh Coal Co., "56 man-trips are run every 24

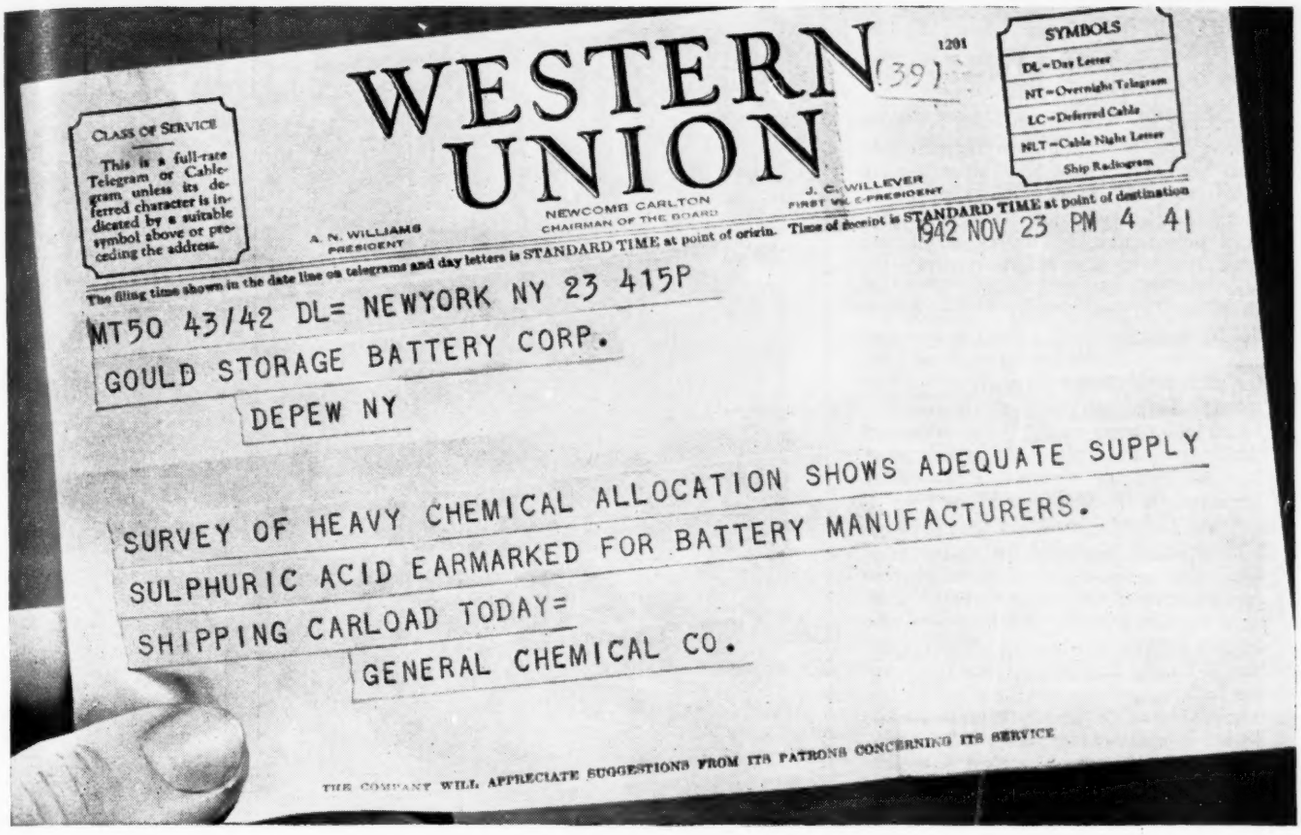
COAL MINING INSTITUTE'S NEW OFFICERS FOR 1943

President—W. P. Vance, general superintendent, Butler Consolidated Coal Co., Wildwood, Pa.

Vice Presidents—G. J. Steinheiser, Pennsylvania State mine inspector, Indiana, Pa.; J. M. Conner, general superintenndent, Allegheny Pittsburgh Coal Co.; G. W. Grove, supervising district engineer, U. S. Bureau of Mines, Pittsburgh, Pa.

Secretary-Treasurer—Francis Feehan, mine safety commissioner, U. S. Bureau of Mines, Pittsburgh, Pa.

Managing Directors—E. A. Holbrook, dean of engineering, University of Pittsburgh, Pittsburgh, Pa.; C. M. Donahue, sales representative, Mine Safety Appliances Co., Pittsburgh, Pa.; M. L. Coulter, mining engineer and safety manager, Clearfield Bituminous Coal Corp., Indiana, Pa.; J. L. Hamilton, assistant manager of mines, Republic Steel Corp., Uniontown, Pa., and R. H. Nicholas, chief mine inspector, Pittsburgh Coal Co., Library, Pa.



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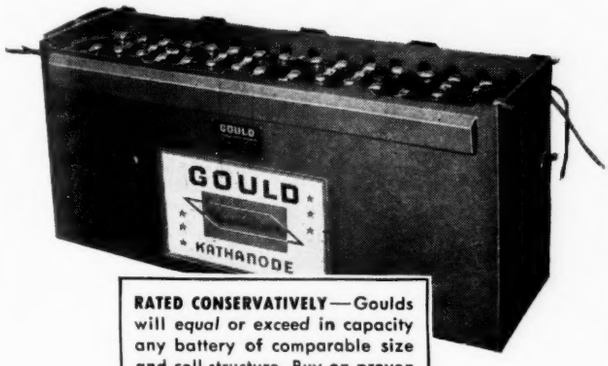

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GOULD THE BATTERY PICKED BY ENGINEERS

hours, and the United Mine Workers would like us to run 20 more. The mine runs triple shift. It is necessary before each trip to examine the couplings and rope. For two years, men, with complete safety, have been riding on the belt into butt headings. These belts ultimately are 2,600 ft. long. A mechanic rides 25 ft. ahead of the men and, when he arrives at a pole switch, he throws it off and stops the belt, after which the men get off. The only danger is should any man sleep on the belt. Extra clearance and height is provided at unloading points."

The speed of the belt is that used for the transfer of coal, as there are no variable speeds. They may run from 160 to 360 f.p.m. The latter speed is not high and the system of operation of the belt man-trips has been approved by the State mine inspector, A. J. Steinheiser.

Today, discipline is on the decline. Men are being employed that, a few years back, the company would not have engaged. Some of the workings are 7 miles from the mine shaft. Would it not, said Francis Feehan, Experiment Station, Pittsburgh, Pa., be feasible to make the heading high enough for car travel? The law requires the height in a belt heading to be 48 in. If made of regular heading height, it would be too expensive, Mr. Snure declared.

At the Harwick mines of the Duquesne Light Co., Harwick, Pa., said J. M. Provost, mine superintendent, a removable seat accommodating six men is provided in man-trips on one side of every car. An empty car is placed between the locomotive and the first car. Crew foremen each have charge of two cars. There are ten crews in each trip. No powder or tools are allowed on any man-trip.

Trips leave on a definite schedule and are kept 300 ft. apart. Those having the longest distance to travel start first. The speed is limited to 6 miles per hour. All headings are well rock-dusted and lighted, and a heated waiting room is provided. At loading and unloading stations, the trolley wire is guarded. Switches are disconnected when cars are being loaded, but the disconnection of these switches affects only the loading stations. Scalers with long bars patrol the roadways every 24 hours and pull down loose roof.

At the Isabella mine of the Weirton Coal Co., Isabella, Pa., said G. McLellan, superintendent, the old cars were used for some time in man-trips. Brakes were put on them, and then flats developed and accordingly cars sometimes left the tracks. Study showed that by accidents to men and material a loss of $25,000 to $30,000 might be expected in the 20 years that the mine would continue working, so the de luxe man-trip was installed (*Coal Age*, November, 1942, p. 51). The losses stated give no consideration to the colds and pneumonia to which men are exposed who travel in open cars. Man-trips leave at 6:10, 6:15 and 6:20 in the morning. Men must remain in the man-trip station until the trip has stopped. First trip in evening leaves at 2:40 p.m. and arrives at the foot of the shaft at 3:07 p.m. At no time may the trip be allowed to exceed its scheduled speed or be ahead of its scheduled time.

War scrap from inner recesses of mine.

Coal Miners Donate Time To Scrap Collection

A new angle to the collection of coal-mine scrap was inaugurated when Alex Barclay and William Ferguson persuaded fellow members of the United Mine Workers at No. 7 mine, Franklin County Coal Corp., Herrin, Ill., to donate their time to the project of combing the underground workings.

Arrangement was made with Superintendent James White whereby half the proceeds from the sale of the scrap would go to the United Service Organizations or any other war organization to be named by the union and half to the company. In two Saturdays—idle days—a total of 28 pit-car loads of scrap was collected, amounting to an estimated 60 tons.

Probably much of this material would not have been discovered except by the men familiar with every nook and cranny of their particular section of the mine. The miner who has "lived" in his panel for weeks or months has the advantage of knowing of everything that has happened and what he may expect to find.

The same arrangement is being carried out at No. 5 mine of this company, also at Herrin. Other Illinois mines have similar programs under way.

Longer Work Week Hangs Fire in December; WMC Plugs Its New "Manning Tables"

(*Continued from page 45*)

or rate and one-half for such work as the case may be. This arrangement shall cover day and monthly men, tonnage, yardage and deadwork rates.

C. Holidays may be worked, provided the coal company, the district organization and the membership of the local union agree upon such holiday work. Time and one-half and rate and one-half shall be paid for all holiday work.

Such payment for holiday work shall not interfere with the payment of time and one-half and rate and one-half for work done on the following Saturday in the same week.

D. No mine worker shall be fined or penalized for absenteeism affecting Saturday or holiday work.

APPALACHIAN OPERATOR PROPOSAL

A six-day week as hereinafter referred to is defined as six consecutive days of mine operation, Monday to Saturday inclusive.

A. The six-day work week is authorized, provided that all individual mine workers working in excess of five consecutive days of not less than seven hours each day in any established work week shall be paid time and one-half or rate and one-half for such work as the case may be. This arrangement shall only be applicable to employees whose wages or rates of pay are established by the existing agreements, including day and monthly men, tonnage, yardage and deadwork rates. Time and one-half rate shall not be applicable for work performed by an employee in excess of seven hours in a twenty-four hour consecutive period necessitated by a change in shifts or work periods. Employees who, of their own volition, do not work seven hours on the sixth consecutive day shall not be entitled to overtime rate of pay.

B. Holidays may be worked, provided the operators, the district organization and the membership of the local union agree upon such holiday work. Time and one-half or rate and one-half shall be paid for all holiday work.

Such payment for holiday work shall not interfere with the payment of time and one-half or rate and one-half for work done on the sixth consecutive day in any established work week.

C. The method of computing overtime wages or rate of pay for tonnage and piece-workers shall be determined by averaging each employee's total earnings at regular rate in any semi-monthly pay period and applying one and one-half times such average daily earnings to any overtime work period involved, the actual number of days worked by the individual mine worker to be used as the divisor.

D. The provisions herein contained as to payment of overtime or over-rate shall not apply to employees employed at power houses, substations and pumps operating continuously for twenty-four hours daily or to employees exempted from the provisions of the original agreement.

E. The Appalachian Agreement of June 19, 1941, the Wage Agreement with the

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B-G representatives can be of valuable assistance to you during the present emergency. **PARTS** Many carry in stock the B-G repair parts most frequently required. Others can assist you in ordering parts. **MAINTENANCE** They will gladly advise you on general maintenance. Many are equipped to bring your machine in and completely overhaul it. **RENTAL** B-G representatives are glad to assist you in locating machines for rental or will assist you in renting a machine which you have idle. **ENGINEERING SERVICE** Your B-G representative will gladly give you the benefit of his experience in any proposed changes in your material handling layout. **NEW MACHINES** New Barber-Greenes are not available except on very high priority. If you are planning a job which will carry such a priority, your B-G representative will give you every possible assistance.

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AURORA, ILLINOIS

42-4

Southern Coal Producers' Association dated July 5, 1941, and the various district agreements between the parties shall remain in force and effect except as modified herein.

ANTHRACITE PROPOSAL

A six-day week, as hereinafter referred to, is defined as six consecutive days of colliery operation—Monday to Saturday, inclusive.

Contract miners, including consideration miners working at consideration rates, shall be paid rate and one-half for the sixth consecutive day worked in any six-day week. Said rate and one-half shall be equivalent to one and one-half times the daily earnings of each miner as determined by dividing his contract earnings in any semi-monthly pay period, after deducting labor, by his starts in said period.

Contract miners' laborers shall be paid rate and one-half for the sixth consecutive day worked in any six-day week. Straight rate shall be paid as provided in said agreement and the additional one-half rate shall be paid by the operator.

Outside and inside company men working a five-day week and paid at monthly, daily or hour rates, whose work week is extended to six days, shall be paid rate and one-half for the sixth consecutive day worked in any six-day week.

Employees coming within the provisions of Sec. 7 of said agreement whose work week is extended one day shall be paid not less than rate and one-half for the additional day, provided they work every consecutive day within the extended work week.

No provision of this amendment shall be construed as granting additional compensation to men in occupations continuously manned and coming within the provisions of Sec. 7 of said agreement; nor shall any provision herein be construed as modifying the established hourly rates of employees covered by said section.

All employees who, of their own volition, work less hours on the sixth day of a six-day week than they customarily work on the preceding five days, shall forfeit all right to additional compensation for the sixth day, as herein provided.

Strikes were in the minority in December. A one-day walkout of about 850 men at the Dixie and Harlan mines of the Black Star Coal Co., in eastern Kentucky, was called off Dec. 9 when the miners agreed to submit alleged grievances to arbitration. In the anthracite region, miners at the Ewen colliery, Pennsylvania Coal Co., struck Dec. 2 against alleged failure to restore voluntary pay cuts taken in the past. The strike later spread to the Underwood colliery and to the operations of the Saporito Coal Co. and brought a message from John L. Lewis asking the men to return to work while a settlement was effected. The Underwood strike was called off Dec. 8.

Paul V. McNutt Given Job

In the broader field of national manpower, over-all control over all the nation's manpower resources was given to the War Manpower Commission by presidential order Dec. 5. The Selective Service system was transferred to the commission, and Paul V. McNutt, chairman, was given the job of providing each month the men specified by the Army and Navy. At the same time, induction of men over 38 into the armed services was banned, except for requirements for special personnel.

In addition, the WMC chairman was directed to take steps to assure that "(a) all hiring, rehiring, solicitation and recruitment of workers in or for work in any establishment, plant, facility occupation or area designated by the chairman . . . shall be conducted solely through the United States Employment Service or in accordance with such arrangements as the chairman may approve; (b) no employer shall retain in his employ any worker whose services are more urgently needed in any establishments, plant, facility, occupation or area designated as more essential by the chairman pursuant to this section."

Provisions for men over 38 being released from the military services for return to essential industries were the subject of later regulations. To secure such release, over-38 men are required to make personal application and prove that they are going to take an essential job. Expectations were that a substantial number of men would be released via this route. Further indications were that a much stricter policy would be followed in restricting transfer of workers from one industry to another.

Preparations for more orderly control of withdrawal of men from industry for military service by use of the new "manning tables" went forth apace in December, although it was stated that use of the tables probably would not become fully effective for some months. The tables are part of a four-part plan, including also preparation of a list of 35 industries designated as "essential activities"; preparation of a list of essential jobs, to be ready about Dec. 31, 1942; and preparation of withdrawal and replacement schedules based on information derived from the tables. Coal mining already has been listed as an "essential activity."

The manning tables are designed to reveal the different jobs in a plant and how many men are engaged in each, type of worker suited to each job and the possibility of securing replacements, training necessary to enable an unskilled worker to do each job, training methods used or available, jobs held by women and those where women could replace men, forecasts of labor requirements, job relationships and possibilities for promotion or upgrading, relative number of skilled and unskilled workers or workers and supervisors, and jobs where physically handicapped persons can be used.

Manning table forms will be distributed on request to employers in war work or essential activities. One copy is retained by the employer and three are sent to the regional WMC office, which in turn will send one each to the State Selective Service Director, WMC in Washington and the regional director of the U. S. Employment Service. From the table each employer would draw up a replacement schedule for approval by the State Selective Service Director. This replacement schedule lists all the jobs and the number of men in each, separating them into men

Improvised Transit Service Helps Miners Save Tires

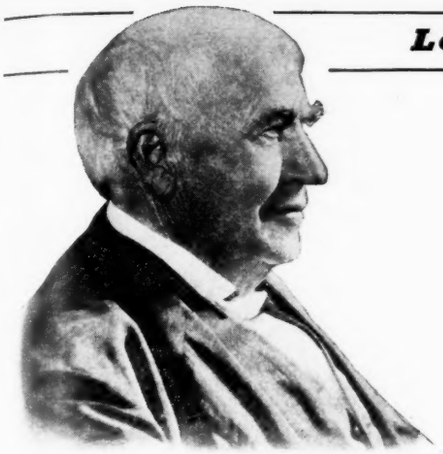
Coal miners all over southern Illinois began to save tires several months ago. Multiple riding, bicycles, even walking to mines nearby were the beginnings. This movement has now taken a much larger step where large groups from a given locality are involved. Pick-up trucks, with owners working at the mines, have been transformed into passenger vehicles by equipping the body with a substantial weather-resisting inclosure and installing seats along the sides to accommodate six or eight men.

Station wagons made their advent in this territory along with munitions plants and other war work. These too have found their way into mining service. Carrying eight or nine men comfortably, they are becoming rather popular for mine workers' travel. Buses in considerable numbers likewise have come into use to transport miners to and from work. Some are privately owned by mine workers, who park them for the day. Others are public carriers and make the mines as part of a daily schedule, handling men on the several shifts. They have pay loads going and coming. The seating facilities run up to 28 passengers, with straphangers to total 40 or 42.

Besides saving rubber all these plans save money for the coal miner. Few people, aside from commercial travelers, can drive a car for as little as 5c. a mile. One example of bus fare for the coal miner is 40c. for a round trip totaling 30 miles.

Waiting for the whistle. A public service bus serving Sahara Coal Co.'s men.

Long the Leader . . . Ever a Pioneer



. . . . Mister Edison was having trouble

IT WAS back in 1891. Thomas A. Edison had invented a magnetic separator for the concentration of low grade iron ore. He had also created new processes for crushing and briquetting the ore. Now, all he had to do was start production.

But he ran into unexpected difficulties. Not with the separator, or the crusher, or the briquetter. His problem concerned something extraneous . . . but essential. He had conveyor trouble. He had expected to use the only types of conveyors then current: scraper and gravity bucket. Neither of these had ever been called upon to handle abrasive materials (which had always been moved in cars) or to attain the required speed (200 TPH). They failed completely.

Mr. Edison next tried a daring experiment. He used a *belt* conveyor. Up to then, belt conveyors had been restricted to carrying grain. They were thin, had no special cover, and were run flat on wooden idlers. Naturally, they wore out quickly. Another experiment seemed doomed to failure.

The First Belt Made Especially for Conveying Materials

ABOUT that time, a man named Thomas Robins called on Mr. Edison. Being a salesman for a rubber company—and, himself, a pioneering spirit—he was interested in this attempted new use for a rubber product.

After looking over the plant and analyzing the handling problem, Mr. Robins believed that a conveyor belt could be created specifically for the purpose.

In fact, Mr. Robins astonished the great inventor and his colleagues by stating that a piece of rubber, when exposed to the heavy falling stream of crushed ore, would outlast many times its own thickness of the hardest steel. What was more, he could prove it.

Then Mr. Robins ran into difficulties. The company he represented would have nothing to do with such a "crack-brained" idea. But he persisted and finally found a concern willing to produce a belt to specifications. Thus was created the first belt made especially for conveying materials.

From that humble beginning and single idea has grown the present firm of ROBINS . . . long the leader, ever a pioneer in modern materials handling machinery. Submit *your* problems to ROBINS.

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For Material Aid in Materials Handling . . . It's ROBINS

not subject to military service (one class) and those that will have to be replaced. When approved, the employer is authorized to place an acceptance number on the schedule to be filed (Form 42-A). The employer then fills out an affidavit (Form 42-B) for all employees within the ages liable to military service, stating the period in each case necessary to secure and train a replacement.

Forms 42-A and 42-B then are forwarded to the Local Selective Service Boards concerned. When an employee is classified or reclassified, the local board will notify the employer. "This system will enable each employer to know not only how many employees will be withdrawn from each department of his plant but also approximately when the withdrawal of a worker will take place and will be able to plan his replacements accordingly. The WMC will assist the employer in every way it can to make such replacements and will advise him and aid him in locating women, older workers and handicapped workers to replace inducted employees, as well as in training and upgrading programs. Once the manning tables and replacement schedules are in operation, deferment of workers will be subject to periodical review."

Pending adoption of the manning table plan, "the Selective Service directors in each State now have withdrawal and replacement schedule forms which will be available to employers upon request. These schedules will provide a basis for withdrawals pending completion of the manning tables. . . . The question of deferment on occupational grounds in each individual case will continue to rest with the local boards and boards of appeal. Local boards, however, will give serious consideration to the replacement time which has been determined under an accepted replacement schedule. The employee retains his right to appeal. In cases where an employer does not fill out either a manning table or a replacement schedule, deferments and inductions will be ordered by the local Selective Service boards as in the past."

Factors in Sectionalizing Mine Power Analyzed at Mining-Electrical Meet

"WITHOUT semi-automatic and full-automatic substations and sectionalizing equipment, mechanized mining cannot reach its greatest productiveness," declared Donald J. Baker, assistant sales manager, I-T-E Circuit Breaker Co., at the December meeting of Mining-Electrical Group, West Frankfort, Ill.

A short circuit on the stub end of a multiple-fed unsectionalized network usually opens only the circuit breaker at the nearest substation. If the fault is between stations, only the circuit breakers of the adjoining stations open. Outlying substations continue to feed the short, resulting in low voltage over a wide area. Harmful results grow worse as long as considerable equipment is operated on low voltage from distant stations. Nearby stations may refuse to close, even though the short circuit or overload may have been removed.

"It seems providential," said Mr. Baker, "that we had the lean years of the thirties," for it provided the "spur for more rapid development of complete mechanization" so necessary to support the Victory program of World War No. II.

"*Coal Age* magazine recently stated that time spent actually loading is what counts in tonnage, but, paradoxically, however, it is the time when loading is not going on that should be the object of constant study and scrutiny. Here is where real results can be attained in improving efficiency. Both New Orient and Valier appreciate . . . the value of improving loading time by preventing the interference from delays in main and secondary haulage."

Two principal sectionalizing problems existed at these mines: (1) the sectionalizing of substation tie lines; (2) the sectionalizing of main from secondary haulage.

Both New Orient and Valier follow today's good practice of tying together all trolley and feeder copper into a common network. Neither uses a loop circuit, for principal feeders do not approach each other. Tying all feeders together saves copper, a most critical metal. But a solid network is far from economical in times of disturbance. Both mines have located tie-line sectionalizing circuit breakers to nullify bad effects.

Substation tie lines are along main haulageways in New Orient and Valier, and faults which open substation circuit breakers penalize haulage. These mines are large producers and they try to limit electrical disturbances to their origin.

Both these mines also attempt to separate primary and secondary haulage with a circuit breaker located near the farthest outbound point reached by the main-line locomotives. A good reason is to prevent faults in the newer and less stable sections of the mine from penalizing the flow of coal to the tipple.

For a total distance of 4,000 ft. the east and west approaches to the main shaft at Valier are sectionalized in 1,000-ft. lengths to protect against delays in the movement of coal from the more important sections of the mine.

The ideally protected mining section, where cutting and loading is done with d.c. power, would have but a single 6- or 8-ton locomotive, a mining machine and a loading machine.

Where the overload adjustments of the sectionalizing circuit breaker must be set high to permit periodic operation of added equipment, it is necessary to sacrifice the sensitivity of the circuit breaker in protecting against high resistance grounds, such as roof falls or wrecks pulling the trolley wire against rails, cars or timbers. Such faults are common and set up hazardous conditions that may start fires and explosions.

A rule to determine 250/275-volt circuit breaker rating is: Multiply total connected horsepower by three. This is ampere rating. The circuit-breaker overcurrent relay is calibrated from 50 to 200 percent of rating. The full load rating of a tie-line circuit breaker need be only half the combined rating of the two stations it connects. In average use it would be adjusted to open at about half rating, as it handles only exchange current between stations.

Improved continuity of operation is perhaps the greatest advantage of sectionalizing. The 10 percent increase in production that often follows sectionalizing comes from plugging many losses in time.

Sectionalizing lowers machinery maintenance cost and economizes in critical metals and manpower. By limiting operating sections to normal power supply, copper and generator equipment can be used to best advantage, permitting increased production without additional substation equipment.

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Association Activities

HARLAN COUNTY COAL OPERATORS' ASSOCIATION reelected all its officers for the coming year at its annual meeting at Harlan, Ky.: President, Charles S. Guthrie, general manager, Harlan Fuel Co., Yancey; vice president, R. E. Lawson, general manager, Cornett-Lewis Coal Co., Harlan, and secretary, George S. Ward. The executive board is composed of C. V. Bennett, Kenes Bowling, R. W. Creech Jr., W. J. Cunningham, S. J. Dickenson, J. S. Greene, Elmer D. Hall, J. Springer Robinson, J. E. Taylor, R. C. Tway and A. F. Whitfield, Jr.

SOUTHERN APPALACHAIN COAL OPERATORS' ASSOCIATION at its annual meeting at Knoxville, Tenn., reelected all its officers and directors for the coming year. They are: President and secretary, L. C. Gunter; first vice president, B. E. Cheely; second vice president, D. E. Griffith; directors, C. S. Blair, Alex Bonnyman, J. E. Butler, B. E. Cheely, D. E. Griffith, C. W. Henderson, W. C. Hutcheson, E. C. Mahan, T. R. Mitchell, S. G. Moore, N. B. Perkins, W. G. Polk, S. M. Reams, Howard Sager and J. B. Gatliff.

WINDING GULF OPERATORS' ASSOCIATION, at its annual meeting at Beckley, W. Va., elected as president L. Epperly, president, Winding Gulf Collieries. E. S. Pugh is the new vice president; W. F. Tams, treasurer, and Hal M. Scott, secretary.

HAZARD COAL OPERATORS' ASSOCIATION, at its annual meeting Dec. 4 at Lexington, Ky., reelected officers as follows: President, G. P. Fitz, president and general manager, Ajax Coal Co.; vice president, W. E. Pritchard, general superintendent, Algoma Block Coal Co.; secretary, A. E. Silcott.

ALABAMA MINING INSTITUTE elected the following officers at its annual meeting: president, I. W. Rouzer, first vice president; R. T. Daniel, president, Franklin Coal Mining Co.; second vice president, Prince DeBardeleben, president, Alabama Fuel & Iron Co.; secretary-treasurer, Hu-

bert E. Mills; counsel, James L. Davidson. Directors are: H. A. Berg, president, Woodward Iron Co.; W. F. Cobb, vice president, Galloway Coal Co.; C. F. DeBareleben, Jr., president, Red Diamond Mining Co.; Harold McDermott, vice president, New Castle Coal Co.; Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co.; B. W. Norton, general superintendent, blast furnaces and mines, Republic Steel Corp.; George F. Peter, president, Southern Coal & Coke Co.; John W. Porter, president, Alabama By-Products Corp.; David Roberts, Jr., president, Brilliant Coal Co.; Ben F. Roden, president, Roden Coal Co., and Herbert Tutwiler, president, Black Creek Coal & Coke Co.

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Coal-Mine Accident Fatality Rate Continues Downward Trend

Accidents at coal mines of the United States caused the deaths of 80 bituminous and 14 anthracite miners in October last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 51,065,000 net tons, the accident death rate among bituminous miners was 1.57 per million tons mined, compared with 2.25 in October, 1941.

The anthracite fatality rate from accidents in October last was 2.74, based on an output of 5,101,000 net tons, against 2.42 in the tenth month of the preceding year.

For the two industries combined, the accident fatality rate in October last was 1.67, compared with 2.27 in the corresponding month a year earlier.

Fatalities during October last, by causes and states, as well as comparable rates for the first ten months of 1941 and 1942, are shown below.

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Safety Manual for Coal Miners Issued by Bureau of Mines

Designed to help halt the upward trend of accidents in coal mines, the U. S. Bureau of Mines has published the "Coal Miners' Safety Manual," 218 pages. Written in the language of and viewing accidents from the standpoint of the miner, the manual contains 73 illustrations depicting safe operations and conditions.

Every phase of coal mining is discussed and 1,108 questions and answers are included to facilitate presentation of the material. Sections of the book are devoted to particular operating phases and each part is prefaced with discussions of accidents which have occured in the past as the result of negligence or oversight.

The manual is the work of J. J. Forbes, former chief of the Coal Mine Inspection Division, now chief of the Mineral Production Security Division; M. J. Ankeny, senior mining engineer, Safety Division; and Francis Feehan, mine safety commissioner, Safety Division. Material for the manual was obtained from their experience in the field, from previous publications of the Bureau and State mining departments, and from examination questions prepared for mine officials by various states.

The book supplements the work of the Coal Mine Inspection Division of the Bureau, which has 107 coal-mine inspectors and a staff of mine explosives engineers and mining electrical engineers in the field investigating operating conditions in coal mines to guard the health and safety of workers.

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Extensive Potentialities Seen For Oklahoma Coal

Rich coal deposits adjacent to McAlester, Henryetta and Tulsa, in Oklahoma, hold about 79 billion tons of the highest grade bituminous gas coal and semi-bituminous smokeless coal found in America, J. G. Puterbaugh, president, McAlester Fuel Co., McAlester, Okla., stated in a paper prepared for the Oklahoma Mineral Industries Conference, held Dec. 10 at Oklahoma City.

Up to the present, Oklahoma has mined only 100 million tons of this vast deposit, which underlies about 10,000 square miles of land. About 50 developed mining properties now in operation are producing around 1,500,000 tons annually with an estimated value of $6,000,000, of which $4,000,000 goes to labor, Mr. Puterbaugh revealed. This is in addition to the fact that Oklahoma in 1940 produced 11½ percent of the total petroleum output of the United States and 7¼ percent of world production and produced 273 billion cu. ft. of natural gas that year.

The Defense Plant Corp. has entered into a contract with the McAlester Fuel Co. to develop for it and its lessees three large modern coal mines, two of which will be located near Carbon, Okla., 6 miles west of McAlester, and one at McCurtain, Okla. If the coke ovens and blast furnaces now under construction at Daingerfield and Houston, Texas, are completed, these mines, now being developed and equipped, will be expected to be producing by May 1, 1943, about one million tons of coal per year, Mr. Puterbaugh's paper stated.

More than 60 raw materials, intermediates and products derived from coal were enumerated in a paper presented at the conference by A. L. Burwell, chemical engineer, Oklahoma Geological Survey, Norman, Okla. Using the plastic industry as an illustration, Mr. Burwell cited transparent colorless acrylic plastics used in the aircraft industry for cockpit inclosures, gun turrets, broad windows, domes and complete bomber noses.

Other byproducts or derivatives enumerated by Mr. Burwell are useful in manufacture of water gas, formaldehyde, adhesives, lacquers, paint, plywood sheets, molded articles, synthetic rubber, electrical insulation, cellulose acetate, rayon, nylon, artificial teeth and many other articles.

New officers elected at the conference, which was attended by about 100 representatives of several industries, included: president, George J. Stein, Eagle-Picher Mining & Smelting Co., Miami, Okla., succeeding J. J. Soukup, Mountain Park Granite Co., Mountain Park, Okla.; secretary, Robert H. Dott, director, Oklahoma Geological Survey (reelected), and

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*

January–October, 1941 and 1942

	Bituminous				Anthracite				Total			
	Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons	
Underground:	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942
Falls of roof and coal	480	482	1.164	1.004	91	111	1.961	2.196	571	593	1.245	1.117
Haulage	159	188	.385	.392	24	32	.517	.633	183	220	.398	.415
Gas or dust explosions:												
Local	18	12	.044	.025	8	5	.173	.099	26	17	.057	.032
Major	58	121	.141	.252	...	...	...	...	58	121	.126	.228
Explosives	19	15	.046	.031	15	11	.323	.218	34	26	.074	.049
Electricity	33	41	.080	.085	4	4	.086	.079	37	45	.081	.085
Machinery	25	33	.061	.069	...	1	....	.019	25	34	.054	.064
Shaft	6	4	.014	.008	2	2	.043	.040	8	6	.017	.011
Miscellaneous	13	27	.031	.056	11	9	.237	.178	24	36	.052	.068
Stripping or open-cut	16	18	.039	.038	3	3	.065	.059	19	21	.042	.040
Surface	43	38	.104	.079	14	9	.302	.178	57	47	.124	.088
Grand total	870	979	2.109	2.039	172	187	3.707	3.699	1,042	1,166	2.271	2.197

*All figures subject to revision.

UNITED STATES COAL-MINE FATALITIES IN OCTOBER, 1942, BY CAUSES AND STATES

	Underground										
State	Falls of Roof	Falls of Face	Haulage	Gas or Dust Explosions	Explosives	Electricity	Machinery	Other Causes	Total Underground	Open-cut	Surface	Grand total
Alabama	3	..	1	..	1	..	..	..	5	..	..	5
Colorado	1	..	..	..	..	..	..	..	1	..	..	1
Illinois	4	..	2	..	..	..	..	..	6	..	..	6
Indiana	1	1	..	..	..	1	..	..	3	..	..	3
Iowa	1	..	..	..	..	..	..	..	1	..	..	1
Kentucky	5	..	1	4	..	1	1	..	12	..	1	13
Montana	1	..	..	..	..	..	..	..	1	..	..	1
Ohio	2	..	3	..	..	..	1	..	6	1	..	7
Penna. (bit.)	8	1	2	..	..	..	..	..	11	..	1	12
Tennessee	1	..	..	..	..	..	..	..	1	..	..	1
Virginia	2	..	..	..	1	..	..	1	4	..	1	5
Washington	..	..	1	..	..	..	..	..	1	..	..	1
West Virginia	15	1	7	..	..	..	..	..	23	..	..	23
Wyoming	..	1	..	..	..	..	..	..	1	..	..	1
Total bituminous	44	4	17	4	2	2	2	1	76	1	3	80
Pennsylvania (anthracite)	5	2	5	..	1	..	..	..	13	1	..	14
Grand total	49	6	22	4	3	2	2	1	89	2	3	94

22 directors. Representing the coal industry on the board are Earl Wells, Starr Coal Co., Henryetta, Okla., and D. J. Hughes, Hughes Fuel Co., Henryetta and McAlester.

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Anthracite Industry Shines In Scrap Collection

The anthracite industry is doing an outstanding job in collecting critically needed scrap metals, according to a statement by Paul C. Cabot, Deputy Director, Conservation Division, War Production Board. Representing only 10 percent of the coal-mining industry, anthracite operators are responsible for 24 percent of the total quantity of scrap, according to reports from the coal-mining industry as made to the Industrial Salvage Branch. Forty-three thousand tons of iron and steel, copper and other non-ferrous metal scrap have been reported by the anthracite industry in the first ten months of 1942.

"This performance," said Mr. Cabot, "is particularly notable when the demand for the production of millions of additional tons of coal is considered."

•

T.C. & I. Ships First Coal From Short Creek Mine

First coal from the Tennessee Coal, Iron & Railroad Co.'s new Short Creek (No. 19) mine, near the Warrior River and Short Creek, in Alabama, was loaded and shipped Dec. 7 in celebration of Pearl Harbor Day. The development represents an investment in excess of $2,000,000 and will give employment to between 600 and 800 men, according to official estimates.

The air shaft, manway and main slope are being excavated simultaneously, and when in full production, late next summer, the mine is expected to produce about 3,500 tons of coal per day. The surface facilities will consist of a coal washer, shop buildings and offices, and a limited number of houses for key employees. The most modern mechanical equipment is to be used inside the operation, the coal to be brought to the surface by a conveyor belt. The mine is the fifth to be placed in production by the company, the others being Edgewater, Docena, Hamilton and Wylam.

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Blast-Furnace Practice

A new text on "The Blast Furnace—Its Raw Materials, Products, Byproducts and Their Chemical Analysis" has been published by the Chemical Publishing Co., Inc., Brooklyn, N. Y., at $3.75. Written by Roy P. Hudson, now assistant superintendent for the Tennessee Products Corp., the book contains two chapters on blast-furnace fuel and its preparation, as well as other material bearing on the use of coal and coke in blast-furnace work.

•

Independents Obtain Charter

A charter for the Miners, Breakermen and Truckers Association of Schuylkill County, Pennsylvania, was approved on Dec. 1 by the Schuylkill County Court. Main offices of the new organization will be at Valley View, with Clyde F. Machamer, of Tower City, as president. Officers said that a drive would be made to have every independent worker in the southern end of the county become identified with the organization.

Bureau of Mines Approvals

Four approvals of permissible equipment were issued by the U. S. Bureau of Mines in November, as follows:

Joy Mfg. Co.—Type PL11-9 elevating conveyor; 10-hp. motor, 250 and 500 volts, d.c.; approvals 461 and 461A; Nov. 2.

Goodman Mfg. Co.—Type 97-30 belt conveyor; 15-hp. motor, 250 volts, d.c.; approval 462; Nov. 3.

Joy Mfg. Co.—Type 11BU-7 loading machine; 50-hp. motor, 250 and 500 volts, d.c.; approvals 463 and 463-A; Nov. 21.

Goodman Mfg. Co.—Type 712-CC shortwall mining machine; 35-hp. motor, 500 volts, d.c.; approval 464A; Nov. 24.

Hanna Buys Entire Stock Of U. S. Coal Co.

Following the purchase on Dec. 7 of controlling interest in the United States Coal Co., the M. A. Hanna Co., Cleveland, Ohio, acquired the remaining capital stock and now owns 100 percent, it was announced Dec. 16 by R. L. Ireland Jr., president of the Hanna company's bituminous subsidiaries.

At the same time it was stated that the Hanna Coal Co. and the United States Coal Co. have been merged and their operations will be conducted in the name of the United States Coal Co., including operation of the Jefferson Coal Co. mines. Production from the entire group of mines, located in Jefferson, Harrison and Belmont counties, Ohio, amounting to about 5,000,000 tons yearly, will be marketed by the Hanna company as sales agent.

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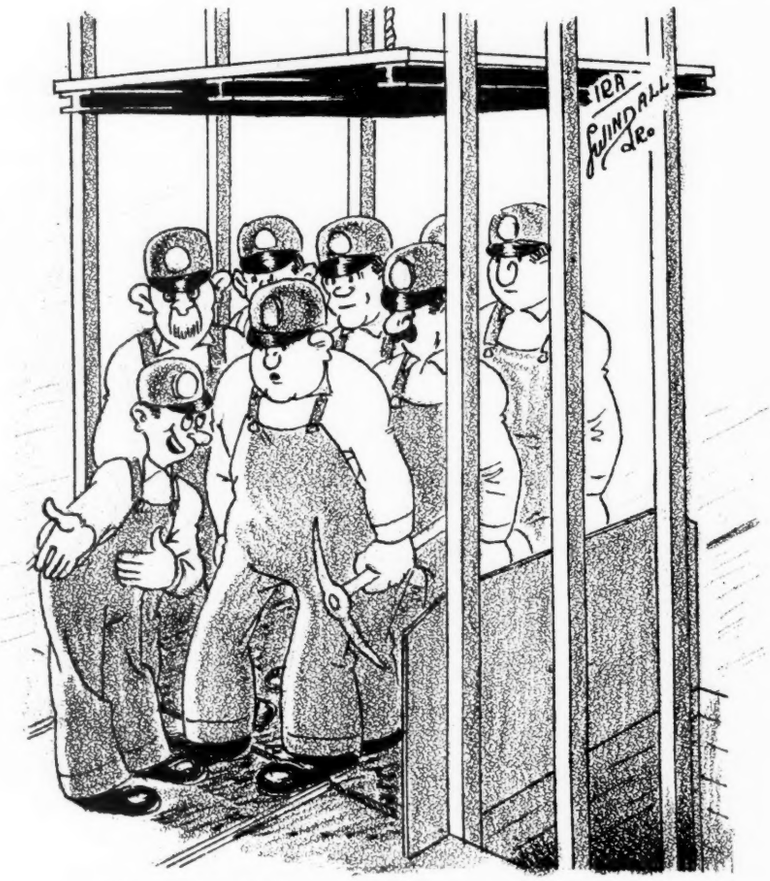
Ontario Breaker Resumes

Ontario breaker of the Supreme Anthracite Coal Mining Co., Peckville, Pa., which was damaged by fire on Christmas a year ago, resumed operations on Nov. 30. The tardy resumption was partly caused by difficulty in obtaining materials for reconstruction. Served by the New York, Ontario & Western Ry., the colliery produced 92,552 tons in 1941 and 105,968 tons in the preceding year. Charles Pomey is president of the producing company.



"Basement floor! Lump! Egg! Nut! Screenings! All out!"

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The advertising rate is $6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

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NEW ADVERTISEMENTS received by 10 A. M. January 28th will appear in the February issue, subject to limitations of space available.

POSITION WANTED

ENGINEER — SUPERINTENDENT, Mining graduate desires position. 30 years experience as engineer, foreman, superintendent, safety, construction, mechanization and preparation. Southern Appalachian location preferred. PW-659, Coal Age, 330 W. 42nd St., New York, N. Y.

WORK WANTED

COAL LOADERS — large, experienced crew. Will work anywhere. Best references. Write: 646 Hegney Place, Bronx, New York.

BUSINESS OPPORTUNITIES

FOR LEASE, on tonnage, stripping coal, several hundred acres, all or part, Coal is high grade by product type, having analysis as follows: Moisture 1.5, Vol. 29.7, Car. 61.6, Ash 7.2, Sulphur 0.8, Phos. .008 Fusion 2900°F. Property has been completely tested. Location near Connellsville Region. Write BO-660, Coal Age, 330 W. 42nd St., New York, N. Y.

FOR SALE

COAL MINE, Pittsburgh seam, Fairmont field, B. & O., capacity 50,000 tons, can increase; for sale. Details, terms, Box 41, Brier Hill, Pa.

FOR SALE

ANTHRACITE CULM BANK

About 75,000 tons, mostly size 4 and 5, ash test about 22%. Reading Railway shipment.

STEINHART'S

145 E. Independence St. Shamokin, Pa.

WANTED

Forty (40) Mine Cars, 36" gauge, 5000# capacity; 12" diam. wheels; size of box 4' x 6' x 18" high. Write giving full details and price.

ROC-GYPSUM, INC.
Victor, New York

WANTED!
16, 20, 24 or 30 cubic yard
AIR DUMP CARS—
Any quantity, type, make or location.
Also 10 to 30-ton Gas or Diesel Locos.
IRON & STEEL PRODUCTS, INC.
38 years' experience
13484 S. Brainard Ave. Chicago, Illinois
"ANYTHING containing IRON or STEEL"

WANTED

To lease or purchase coal property on or near Railroad. Must be good coal and favorable mining conditions. Prefer Eastern Ky., Va. or W. Va. Have equipment. Send full particulars. Will return same. Write

J. GLEN STONE, *Engineer*
Soddy, Tenn.

FOR SALE

1—Goodman Type 12G3 Mining Machine COAL CUTTER — In good operating condition, and complete with following: 6½ ft. cutter bar, Standard Goodman cutter chain. 70 Tooth beeble Gear. The overall height is 35". The machine is mounted on Standard 42 gauge truck 14" wheels. The tail rope on the machine is ½-H diameter and 20 ft. in length. The machine also has 210 ft. of 3 conductor all rubber covered mining machine cable. The machine has approximately $300.00 worth of extra parts including set of 8" wheels.

FS-662, Coal Age
520 N. Michigan Ave., Chicago, Ill.

DIAMOND CORE DRILLING, for any mineral. More than sixty gasoline, steam and electric drills, suitable for any job. **OUR SPECIALTY—testing bituminous coal lands.** Satisfactory cores guaranteed. Prices very reasonable.

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REBUILT EQUIPMENT—READY TO SHIP

MINING MACHINES
CE-6 Sullivan 250 v. DC.
CE-7 Sullivan Shortwall 250 v. 6' bar

MINE LOCOMOTIVES
6 ton Atlas 220 v. 3 ph. 60 cy. 36" ga.
10 ton Milwaukee GASOLINE

ROTARY CONVERTERS
1—500 kw. G.E., type HC-8, 600 volt, 900 rpm, complete with transformers and switchboards
200 kw. G.E. 275 v. DC 900 rpm complete with transformers.

TRANSFORMERS—1 ph. 60 cy.
3—1500 kva, 22000, 6600 Pgh.
3—150 kva, 22000, 6000 Pgh.
1—150 kva, 2200, 230/460 G.E. 3 ph.
1—100 kva, 2200, 110/220 G.E. 3 ph.
1—100 kva, 2200, 110/220 West.
3—100 kva, 6600, 550/440/220 Pgh.
1—100 kva, 2200, 220/110 West.
2—75 kva, 2200, 220 Burke 3 ph.
2—50 kva, 2300, 220/440 G.E. 1 ph.
3—50 kva., 11430/6600, 550 Al. Ch.
3—50 kva, 6600, 575 G.E.
1—50 kva, 2200, 220 Burke
3—50 kva, 2200, 110/220 West.

SPEED REDUCERS
1—3 HP. Farrel-Herringbone double reduction ratio 6 to 1.
1—5 HP. Boston single reduction ratio 9.25 to 1.
17—8 HP. Tate Jones worm gear 36 to 1 ratio.
3—10 HP. D.O. James spur gear 840 to 30 rpm.
7—10 HP. Horsburg double reduction ratio 6 to 1.
2—20 HP. Sturtevant ratio 14.5 to 1.
5—60 HP. Poole Eng. Co. 5½ to 1 ratio.
1—150 HP. Falk Co. ratio 7.31 to 1.
1—450 HP. Kerr Reduction 3800 to 720 rpm.
1—150 HP. R.D. Nuttal ratio 1.6 to 1.

M. G. SETS—SYNCHRONOUS
200 kw. West. 600 v. DC 600 rpm, 220/3/60.
150 kw. West. 275 v. DC 600 rpm. 2300/3/60.
125 kw. Cr. Wh. 250 v. DC 1200 rpm. 220/440/3/60 Ind.

A.C. GENERATOR—3 ph. 60 cy.
219 kva. G.E. 2200/440/220 v. 200 rpm.

HOISTS
25 HP. Thomas 18" face 20" dia.
40 HP. Single drum AC 220/3/60.
100 HP. Lidgerwood 2 drum AC or DC Motor.

CENTRIFUGAL PUMPS
4x3 Harris, 320 rpm.
4x4 Weinman, 500 gpm.
6x6 Gould, bronze, 1300 gpm.
8x8 Weinman, bronze.
5x6 Hayton, 750 gpm.
6x6 Manistee, 750 gpm.
6x6 American, 1000 gpm., bronze.
6x6 Weinman, 1000 gpm.

ENGINE GENERATOR SETS
50 kw. 250 V. D.C. Generator direct connected to International Diesel Engine.
50 kw. West. 220/3/60 Ames STEAM
75 kw. G.E. 220/3/60 Bessemer GAS.
75 kva. Allis Chal. 220/3/60 dir. con. 14x14 Steam Engine.
80 kw. West. 250 V. Belted 110 Bessemer GAS.
225 kw. Elec. Machy. 2300/3/60 Ideal STEAM.

TURBINE
1—Kerr Steam Turbine 450 BHP 3800 rpm., 5" intake 12" exhaust with Kerr Reduction Unit 3800 to 720 rpm., 115# pressure.
1—1000 kw. G.E. Turbo 6600/3/60 150# Pres.

SLIPRING MOTORS—3 ph. 60 cy.

No.	HP	Make	Type	Volts	Rpm
1	1500	Allis. Chal.	ANY	2200	485
1	700	G.E.	MT-432	2200	393
1	400	West.	CW	2200/550/2-0	435
1	400	West.	CW-967A	220-440	1170
1	300	G.E.	I-M	220-440	600
1	260	Burke	EMV-65	220-440	600
3	250	G.E.	I-M	550	600
3	250	G.E.	I-M	2200/220/440	600
3	200	G.E.	I-M	2200/220/440	600
1	200	G.E.	I-M	2200	514
1	200	West.	CW-956A	2200	690
1	150	G.E.	I-M	220/440	900
1	100	West.	CI	220/440	1750
1	75	West.	CI	220/440	860

SQUIRREL CAGE MOTORS—3 ph. 60 cy.

HP	Volts	Make	Type	Speed
500	2200/440/220	West.	CS	720
400	2200/440/220	West.	CS	500
450	2200/440/220	West.	CS	600
400	2200/440/220	West.	CS	600
350	2200/440/220	West.	CS	450
300	2200/440/220	West.	CS	400
200	2200/440/220	West.	CS	250
200	220/440	West.	CS	580
200	2200	West.	CS	870
150	550/220/440	G.E.	—	575
150	220/440	G.E.	KT-562	690

SCALES
6—Fair. Morse #11½ 3 beams (2—200# ea. 1—50 lbs.) platform 16¼ x 21⅝.
9—Howe Scales 3 beams—platform 14½x22.

DUQUESNE ELECTRIC & MFG. CO. . . . . PITTSBURGH, PA.

MINING EQUIPMENT

1—100 KW, 250/275 volt, D.C., G.E. Rotary Converter with 2300 volt Transformer and manual switchboards.
1—200 KW, 6 phase, 60 cycle, General Electric Rotary Converter.
1—Motor-Operated Brush Raising Mechanism for Rotary Converter.
3—165 KVA, 6600-445 volt G.E. Rotary Converter Transformers.
3—100 KVA, 2300 volt, G.E. Rotary Converter Transformers.
3—55 KVA, 2300/4000Y, G.E. Rotary Transformers.
1—Ingersoll-Rand Portable Air Compressor with texrope "V" belt drives.
Motors, 3 to 50 HP, AC & DC in stock. Different types, speeds and voltages. Rotary switchboards built to order.

R. H. Benney Equipment Co.
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NORWOOD, OHIO

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Locomotives—Mining Machines—Pumps—Motors—Transformers — Steel Tipples — Rescreeners — Steam Hoists — Electric Hoists — Compressors — Loading Booms—Engines—Generators—Scales—Miscellaneous Mine Equipment

Complete Mines dismantled and sold.

HAIR EQUIPMENT COMPANY
Office and Warehouse
Reed and Election Streets
BENTON, ILLINOIS

ROTARY CONVERTERS
500 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal type, 2300/4000 V. Transformers.
500 KW G.E. SYN. 275 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
300 KW G.E. SYN. 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM, Pedestal type, 2300/4000 V. Transformers.
150 KW G.E. SYN. 275 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
150 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM, 2300/4000 V. Transformers.

MOTOR GENERATORS
300 KW G.E. SYN., 275 V., 2300/4000 V, 3 Ph., 60 Cy., 1200 RPM, 80% P.F. Manual Switchgear.
300 KW G.E. SYN., 275 V., 2300/4000 V. 3 Ph., 60 Cy., 720 RPM, 80% P.F. Manual Switchgear.
250 KW G.E. SYN., 275 V., 2300/4000 V. 3 Ph., 60 Cy., 720 RPM, 80% P.F. Manual Switchgear.
200 KW G.E. IND., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
200 KW R.W. SYN., 275 V. 2300/4000 V., 3 Ph., 60 Cy., 900 RPM, 80% P.F. Manual Switchgear.

LOCOMOTIVES
10-T WESTGHE, 250 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHE, 500 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHE, 250 V., 917-C Mts., 36"-44" Ga.
8-T WESTGHE, 250 V., 906-C Mts., 36"-44" Ga.
8-T WESTGHE, 500 V., 906-C Mts., 36"-44" Ga.
6-T JEFFREY, 250 V., MH-88 Mts., 36"-42" Ga.
6-T JEFFREY, 500 V., MH-88 Mts., 36"-42" Ga.
6-T WESTGHE, 250 V., 904-C Mts., 36"-42" Ga.
5-T WESTGHE, 250 V., 902-B Mts., 56½" Ga.
4-T WESTGHE, 250 V., 902-C Mts., 36" G.
4-T GOODMAN, 250 V., 42-I Mts., 40"-44" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK COMPANY
Incorporated
501 Grant Building Pittsburgh, Pa.

RAILS—CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

M. K. FRANK
480 Lexington Ave. New York City
450 Fourth Ave. Pittsburgh, Pa.

RAILS and ACCESSORIES
RELAYING RAILS—Super-quality machine-reconditioned—not ordinary Relayers.
NEW RAILS, Angle and Splice Bars, Bolts, Nuts, Spikes, Frogs, Switches, Tie Plates, and all other Track Accessories.
Phone, Write or Wire
L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

FOR SALE

20, 5BU Loading Machines

A. C. MOTORS
30 Units, 15 to 75 H.P. squirrel cage 3/60/440

D. C. MOTORS
15 Units, 3 H.P. to 60 H.P., 230 V.
40 KW, 110 V. D.C. Generator
200 KW, 600 V. Motor Generator Set synch. motor, 3/60/2200
1000 KW Turbine Type G.E. Generator 3/60/2300, 3600 RPM
500 KW G.E. Skinner Uniflow Steam Engine Generator, 250 V. D. C.
6½-yd. 320-B Bucyrus Stripping Shovel
¾-yd. Link Belt Crawler Crane, 45' boom

IRON & STEEL PRODUCTS, INC.
38 years' experience
13484 S. Brainard Ave., Chicago, Illinois
"*Anything* containing IRON or STEEL"

IRON and STEEL PIPE
New and Used
Large stocks, all sizes attractive prices
L. B. FOSTER COMPANY, Inc.
P. O. Box 1647 Pittsburgh, Pa.

NEW and REBUILT
STORAGE BATTERY
LOCOMOTIVES
1½ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Penna.

New and Guaranteed Tested Reconditioned
STEEL PIPE AND BOILER TUBES
In Light Weight, Standard or Heavy
Jos. Greenspon's Son Pipe Corp.
NAT'L STOCK YDS (ST CLAIR CO) ILL.

Prompt Shipment From Our Warehouse

MINING MACHINES
2—12 GE Goodman 220/3/60 AC 6′ Bar.
3—12 AB Goodman 250 V. DC 6′ Bar.
2—35 B Jeffrey 250 v. 6′ Bar #18972 with Bowdil Chain and #11416, both with cables.
2—35 B Jeffrey 250 V. 6′ Bar

LOCOMOTIVES (Battery)
5 Ton Jeffrey storage battery 42 to 44″ Ga.
5 Ton Ironton type E 42″ Ga.
4 Ton Jeffrey 44″ Ga.

(Haulage)
13 Ton Jeffrey 250 V. 40″ 42″ Ga. M.H. 110 Motors.
10 Ton Westgh. 250 V. 36″ Ga.
6 Ton Whitcomb 250 v. 40/42″ Ga.

MG SETS 3 ph. 60 cy. (Syn.)
150 KW West. 550 V. DC 2200 V. AC-1200 RPM
100 KW Cr Wh. 250 V. DC—440/3/60/1200 RPM
100 KW G.E. 550 V. DC 2200/3/60 AC 900 RPM
90 KW Al.Ch. 250 V. 2200 V. AC 900 RPM

ROTARY CONVERTERS
3—150 KW HCC-6 Gen'l Elec. 275 v. 1200 RPM with switchboards and Transformers 2300 or 4000 v. 3 ph. 60 cy.
4—500 KW HCB Gen'l Elec. 275 v. with switchboards and Trans. 6600 or 3800 v. 3 ph. 60 cy.

SYN. MOTORS 3 ph. 60 cy.

HP	Make	V.	Speed
350	Al.Ch.	2200	600
2/75	Westgh.	2200	900

HIGH TORQUE WOUND ROTOR MOTORS (Wound Rotors)

HP	Make	V.	Speed
200 (5)	G.E.	2200	600
150 (4)	G.E.	2200	600
125 (1)	G.E.	2200	600

SLIP RING & SQ. CG. MOTORS (3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
700	G.E.	393	S.R.	MT 432
400	West.	500	S.C.	CS
300	G.E.	600	S.R.	IM
200	Al. Ch.	600	S.C.	
150	G.E.	720	S.R.	IM
150	West.	580	S.C.	CCL
150	G.E.	600	S.R.	IM
125	Al. Ch.	435	S.R.	
100	G.E.	500	S.R.	MI-25 cy.
75	G.E.	865	S.C.	KT

HOISTS
75 HP Lidgerwood sgl. fr. drum
50 HP Diamond 2 drums same Shaft
30 HP Clyde sgl. drum AC Motor
15 HP Lidgerwood sgl. dr. AC Motor

400 TRANSFORMERS (Westgh. & GE 1 ph.)

Qu.	KVA	Pri. V.	Sec. V.
3	1	2080/2200	115/230
5	2	"	"
100	5	"	"
82	7½	"	"
71	10	"	"
1	30	"	"
3	37 Rotary	4400/185	"
2	100	"	"
1	150	3 Phase "	230/460

ENGINE GENERATOR SETS
100 KW 250 v. DC Westgh.—Skinner Engine

D. C. MOTORS
1 to 125 HP, all speeds

MOORHEAD-REITMEYER CO., INC.
PITTSBURGH, PENNSYLVANIA

POWER EQUIPMENT
from a Big Concrete Plant

PUMPS
1—C.H. & E. Model #11, C.A., capacity 125 GPM at 320# pressure—4½ x 5½ single acting Triplex Road Pump with Waukesha 6 cylinder 45 H.P. gasoline engine.
1—Gorman Rupp—R 100, Triplex Pump on Trucks, 100 GPM at 600# pressure with Hercules 55/65 H.P. gasoline engine.
1—Gorman Rupp R 125, Triplex Pump on trucks, 125 GPM at 320# pressure with Hercules 40/50 H.P. gasoline engine.

HOT WATER HEATING SYSTEM
1—Type B Patterson combined hot water service and storage heater—120″ dia. x 279″ overall length—Storage capacity 12,000 gals., 50# water working pressure. Will heat 12,000 gals in one hour from 40° to 125° with steam at 100# pressure tested for 150# and includes Thermostatic control valve.
1—Cleaver Brook, O.B. 30—Oilbilt steam generator plant. Will develop 10,500# steam hourly from and at 212° F. Approximately 300 H.P. Boiler.

CONVEYORS
5—Conveying Systems — Robins Conveying Belt Co.
1—Transfer Conveyor 36″ x 202′
1—Stocking Conveyor—36′ x 1000′
1—East Tunnel Conveyor—36″ x 500′
1—West Tunnel Conveyor—36″ x 500′
1—Mixing Plant Conveyor—36″ x 256′
These units are complete with chutes and gates and all electrical equipment for its operation. Belting is Equator Brand, 6 ply, 28 oz. duck.

Bids will be accepted for all or any part of units offered for sale. Sale authorized by Bureau of Docks, U. S. Navy. Any or all equipment can be withdrawn at the discretion of the advertiser. Other miscellaneous equipment available. Send us your inquiries.

PROMPT SHIPMENT

BAYONNE ASSOCIATES
U. S. Naval Supply Depot
Bayonne 3-5800 Bayonne, N. J.

A REAL PURCHASE OPPORTUNITY!
ELECTRIC SHOVEL
6½-7½ yard, Bucyrus 320-B; R. R. Trucks
IRON & STEEL PRODUCTS, INC.
38 years' experience
13484 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON or STEEL"

Immediate Shipment
Low Prices

NEW RUBBER

Guaranteed
High Grade

CONVEYOR and TRANSMISSION BELTING

CONVEYOR BELTING ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48″	8	1/2″	1/16″
42″	5	1/8″	1/16″
36″	6	1/8″	1/16″
30″	6	1/8″	1/16″
30″	5	1/8″	1/16″
24″	5	1/8″	1/32″
24″	4	1/8″	1/32″
20″	5	1/8″	1/32″
20″	4	1/8″	1/32″
18″	4	1/8″	1/32″
16″	4	1/8″	1/32″
14″	4	1/16″	1/32″
12″	4	1/16″	1/32″

TRANSMISSION BELTING HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18″	6	10″	6	6″	5
16″	6	10″	5	5″	5
14″	6	8″	6	4″	5
12″	6	8″	5	4″	4
12″	5	6″	6	3″	4

ELEVATOR BELTING HEAVY DUTY RUBBER COVERED

Width	Ply	Top-Bottom	Covers
12″	6	1/16″	1/16″
14″	6	1/16″	1/16″
16″	6	1/16″	1/16″
18″	6	1/16″	1/16″

ENDLESS "V" BELTS
"A" — WIDTH — All Sizes
"B" — WIDTH — All Sizes
"C" — WIDTH — All Sizes
"D" — WIDTH — All Sizes
"E" — WIDTH — All Sizes
Sold in Matched Sets

RUBBER HOSE
ALL SIZES FOR AIR — WATER — STEAM — SUCTION — FIRE — WELDING ETC.

Inquire For Prices :—: Mention Size and Lengths

CARLYLE RUBBER CO., Inc.
66 PARK PLACE New York, N. Y.

★DISMANTLING MINE★
ONE MILE FROM LOGAN—*All 250 Volt, 44″ track gage*

GENERATORS
1—150-KW Motor-Generator set, 500 volt
1—150-KW Steam plant, 250 volt
1—100-KW Ridgway Motor-Generator set, 250 volt
1—90-KW Westinghouse M-G set 250 volt

LOCOMOTIVES, 250 VOLT
1—10-ton Jeffrey MH-78, 32″ high, 44″ Gage
1—8-ton Westinghouse 65, 42″ gage
1—6-ton Westinghouse, 904-C, 44″ gage
1—6-ton G.E. 823, 44″ gage

CUTTING MACHINES
1—124-EJ Goodman slabbing machine, 250 volt
1—CR-2 Sullivan low vein shortwall, 250 volt
2—CE-7 Sullivan, 7½′ bars, 250 volt
1—CE-7 Sullivan, 7½′ bar, 220 volt, A.C.
12—G3 and 212-G3, 220-440 volt, Goodman A.C. motors
Crusher 31½ x 36″ Scotdale double roll, complete with 60-HP. motor.
TIPPLE 1—4-track Kanawha tipple complete with all machinery, motors and magnetic starters just as released from service. A real buy if you need a good tipple.

A.C. & D.C. MOTORS AND MANY OTHER ITEMS IN STOCK.
LET US KNOW YOUR NEEDS—WE BUY, SELL AND TRADE.

ALL-STATE EQUIPMENT CO., Inc.
LOGAN, WEST VIRGINIA *Phone 884*

MINE HOISTS and HOIST MOTORS

Jones Mining Equipment Co.
541 Wood Street Pittsburgh, Pa.

FOR SALE
3—Ironton 5 ton BATTERY *LOCOMOTIVES*
200—*MINE CARS*, wood body
All are 44″ gauge but may readily be changed to narrower gauge.
1—25 KW Motor Generator *BATTERY CHARGER*

Also a number of DIESEL MOTOR GENERATORS, TRANSFORMERS, COMPRESSORS, BOILERS, ETC.

Associated Metals & Minerals Corp.
40 Rector Street New York, N. Y.

FOR SALE

JOY LOADING MACHINES

15—5-BU Joy Loading Machines, 250 volt. Just taken out of service and in excellent condition. Have been loading 450-ton of coal per shift.

STEEL MINE CARS

100—2½-ton, 42" gauge, rotary dump mine cars in perfect operating condition. Height overall 38", length 122", width 61½", length of body 98", 90 cu. ft. level full, 16" Timken Bearing Wheels, link and pin couplers, 4-wheel brakes, equipped with car haul bracket on bottom, Toncan Copper Bearing Steel used in sides and ends.

SHORTWALL MINING MACHINES

15—Jeffrey 35-A, 50 H.P., 250 volt DC, 7½' cutter bars.
7—Sullivan CE-7 AC Shortwall Mining Machines, 7½' cutter bars, self-propelled trucks and cable reels.

LOCOMOTIVES

4—Goodman 15-ton Tandem Locomotives, type 132-O-4-T, 250 volt ball bearing motors. Equipped with equalizers and contactor control. Completely rebuilt. 42" and 44" gauge.

25—6, 8, 10 and 15-ton completely rebuilt Jeffrey, Goodman General Electric and Westinghouse Locomotives. 36" to 48" gauge.

MISCELLANEOUS

Steel Tipples, Electric Hoists, Motor Generator Sets and Rotary Converters, all sizes.

We Specialize in Buying Complete Mines That are Going Out of Business or From Receivers in Bankruptcy, Administrators of Estates, Etc.

Frank J. Wolfe

COAL MINE EQUIPMENT SALES COMPANY
306-7 Beasley Building L. D. Phone-34 Terre Haute, Indiana

LINK-BELT UNLOADING TOWER

SUITABLE FOR COAL OR ORE

GANTRY TYPE • CAPACITY 750 T.P.H.
RAIL SPAN 44' • OVERALL HEIGHT 114' WIDTH 166'
COMPLETE WITH WIRING AND 8 SELF-CONTAINED 3 PHASE MOTORS AND BUCKET

ERMAN-HOWELL & CO., INC.
332 S. *MICHIGAN AVE.* *CHICAGO, ILL.*

PIPE—MACHINERY—GAS ENGINES
AIR COMPRESSORS—DIESELS—PUMPS

Some Steam Engines and Boilers available only slightly above the metal price

BRADFORD SUPPLY COMPANY
WAYNE, WOOD COUNTY, OHIO Near Toledo

DRAGLINES—CRANES
5 Large 8-Yd. Steam 175' Boom
STRIPPING EQUIPMENT
Rent, Sale, or Contract
LEWIS-CHAMBERS CONSTRUCTION CO., INC.
1402 Carondelet Bldg., New Orleans, La.

WE BUY AND SELL
MOTORS
TRANSFORMERS
MOTOR GEN. SETS
OIL SWITCHES
AIR CIRCUIT BREAKERS

ELECTRIC EQUIPMENT CO.
678 Lake Ave., Rochester, N. Y.
Tel: Glenwood 6783

MINING MACHINES
Goodman Standard & Universal.
AC & DC Rebuilt & Guaranteed.
Jeffrey 35L—250V

MINE LOCOMOTIVES
5 to 20 ton.

STRIPPING SHOVELS

M. G. SETS & ROTARY CONVERTERS

PUMPS and FANS

COAL CRUSHERS

Will buy, sell or exchange. What do you need?

The Industrial Equipment Corp.
Warehouse: Carnegie, Pa.
P. O. Box 1647 Pittsburgh, Pa.

---

6 YD. STRIPPER SHOVEL

200-B Bucyrus 6 years old. 75 ft. Boom, 60 ft. Dipper stick, 6 yd. Dipper Steam Shovel.

LIGHT PLANT

4 KW Kohler 120 V—Gasoline Lighting Plant.

DIESEL DRAGLINES

3W 4W & 5W Monighan Walkers, 90 to 110 ft. booms.
3 Yd. P.&H. 800, 97' boom.
2½ Yd. 48B Bucyrus 80' boom.
2 Yd. 750 Lima, 60' boom.

AIR COMPRESSORS:
(7) Steam 66 ft., 300 ft., 600, 1000 & 1940 ft.
(12") Belted, 360, 676, 870, 10000, 1300 ft.
(12) Diesel 105, 315, 520, 676 & 1000 ft.
(6) Electric, 1300, 1500, 2200, 2600, 5000 ft.
(14) Gasoline, 110, 160, 220, 310 & 370 ft.

COAL CRUSHERS:
Jeffrey Single Roll 18x18, 24x24 & 30x30
Link Belt 26x24 Double Roll Crusher

HYDRAULIC CARWHEEL PRESSES:
100 Ton, 150 Ton, 300 Ton, 300 & 400 Ton Caldwell - Niles - Wood - Watson Stillman

RUBBER CONVEYOR BELTS:
1000' 60", 600' 30", 300' 20", 1600' 42", 900' 48", 1450' 36". 1200' 24", 900' 18", 600' 16", 350' 14".

CONVEYOR PARTS:
Idlers, Heads & Tail Pulleys, Steel Frames, Tripper, etc., 14 In., 60 In. Large Stock here.

SYNC. MOTOR GENERATORS & ROTARYS:
100 KW Ridgway 1200 RPM 3/60/2300/250-275
150 KW G.E. 1200 RPM 3/60/2200-250-275
200 KW Ridgway 900 RPM 3/60/2200-250-275
3—100 KW G.E. 275 v. 1200 RPM Rotarys

STORAGE BATTERY LOCOMOTIVES:
2½ ton Whitcomb 24 ga. New Batteries
2—4 ton G.E. 30 in. ga.
3—5 ton Mancha 30 in. ga.
4—5 ton G.E. 36 in. ga.
3—7 ton Goodman 36 ga. Battery & Trolley
8—6 ton Baldwin Westgh. 42 ga. & 36 ga.

TROLLEY LOCOMOTIVES:
2½ ton Westinghouse 24 ga.
4—6 ton & 3—5 ton Goodman 36 ga.
3—6 ton Goodman 30 ga.
4—6 ton Goodman 42 ga.
5—6 ton Westinghouse 42 ga.
2—8 ton Goodman 36 ga.
10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:
9 Tyler Hummer 3x6, 4x5, 4x8 & 4x10
2 Robins Gyrex 4x8½
4x12 Niagara, 3x8 L. B., 5x6 Simplex

CARS:
120—4 ton 42 ga. S.D. Mine Cars
60—Western 16-20-30 yd. Side Dump

SHOVELS, CRANES & DRAGLINES:
3 W 90' Boom, 6 W 160' Boom, Model 6150, 175' Boom, Diesel, Monighan Walkers
1 yd. K 30 Link Belt 50' Boom Crane
2 yd. Page 70' Boom Diesel Dragline
1¼ yd. Marion 450 Elec. Shovel
1½ yd. Lima Diesel Shovel & Dragline
2 yd. Link Belt Elec. Shovel & Dragline
25 ton Browning 50' Boom Loco. Crane
7 Conway 20A, 30A, 50A, 60 & 75 Muckers

MINE LOADERS:
Junior Joy 36 ga. Low Pan
Conway 20 Mucker
3—5 BU & 7 BU 36 or 42 ga. Joy
9—Goodman 200 & Jeffrey 441

MISCELLANEOUS:
5'x160' Traylor Rotary Dryer
100 HP G.E., 3/60/440 v.-900 RPM Elec. Motor
6 Goodman 12CA & 12DA 6 ft. Cutters
9x8 Sullivan Mine Compressors
Clamshell Buckets ¾, 1, 1½ & 2 yd. Cap.
30 ton & 12 ton Vulcan Std. Ga. Gas. Loco.

WANTED TO BUY:
Complete Mines—M.G. Sets, Locomotives, Compressors, Conveyors, Cranes, Crushers & Rotary Converters. Also Rails, Screens, Pumps, Cars, Mine Loaders & Mining Machines.

Tidewater Equip. & Machy. Corp.
305 Madison Ave. New York, N. Y.

FOR SALE

Single Drum Mine Hoist manufactured by Ottumwa Iron Works. Drum 108 inches diam. x 84" face grooved for 1000 ft. of 1¾" cable. Also have lagging to cover drum if smaller cable is used. Proportional Pressure Oil Braking System and Lilly Governor. Speed 700 ft. per minute.
Geared to 400 H.P. 2300 Volt, 3 phase, 60 cycle General Electric Motor with complete contractor control and resistance.

Price $18,000.00
Available March 1, 1943

Also complete headframe, rock bin, self dumping muck cage and man cage with counter-balance attached.

Price on application
Available May 1, 1943

All of the above now in operation at Lackawack, N. Y., where it can be inspected.

MASON & HANGER CO., INC.
Lackawack, N. Y.

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1942 *COAL MINING CATALOGS*. Where † appears after a company's name the advertisement does not appear in this issue, but was in preceding issues.

■

SEARCHLIGHT SECTION

(Classified Advertising)

"Take care of yourself, Dad"

Last year over 180 *million* man-*days* of productive time were lost through industrial accidents—many of them needless. Think how many tanks, ships, guns, planes those 180,000,000 man-days of work would have made! . . . Yes, dad—take care of yourself. Your soldier-son needs your factory production to win.

American Cable **TRU-LAY PREFORMED WIRE ROPE** is helping keep down accidents every day because it is a safer rope to use and handle. **TRU-LAY PREFORMED** resists kinking and snarling. It resists whipping; spools better. Worn, broken and chisel-sharp crown wires refuse to wicker out to jab workmen's hands. They remain in place, making **TRU-LAY** *much* safer to handle.

Use American Cable **TRU-LAY PREFORMED** for your next rope. Do everything possible to reduce lost-time accidents. America needs your full-time production.

TRU·LAY *Preformed*

AMERICAN CABLE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Tacoma

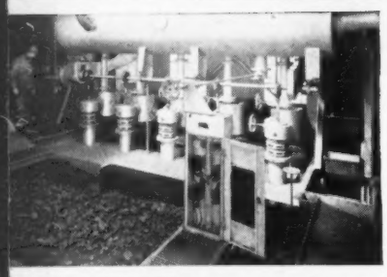
AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT, CONNECTICUT

ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

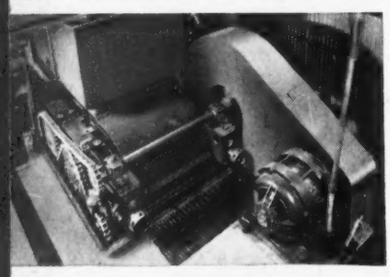
SHAKING SCREENS

Tight connections with minimum "play" in reciprocating parts are essential to long life. Frequent inspection, ample lubrication required. Keep all bolts tight. Proper adjustment of bushings in connecting rods may prevent a serious breakdown. Spare drive shaft, eccentrics, and connecting rods are good insurance against delays if these vital parts fail.



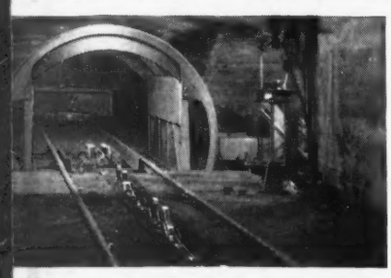
WASHING UNITS

Inspect frequently. Remove accumulation of "tramp" iron that might damage refuse elevators and replace worn buckets and chain parts promptly.



SIZER-CRUSHERS

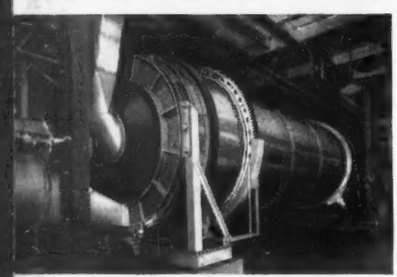
Worn and misaligned rolls not only produce excessive oversize but put heavy strain on the entire machine. New rolls or new segments will give a more uniformly-sized product and also protect machine against possible damage.



CAR DUMPERS, FEEDERS AND HAULS

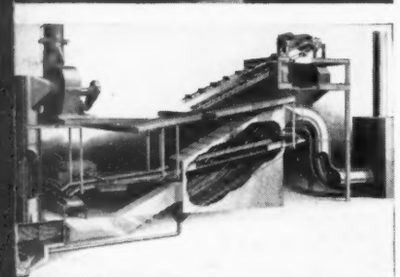
Cleanup regularly and frequently. An accumulation of dirt on rings and rollers will cause excessive wear in these moving parts, as well as bearings. Worn brakes and cars badly out of shape may wreck the dumper.

Wear, in chain links and pins increases chain pitch and may lead to broken sprockets. Loose bearing bolts may lead to broken gears. Worn brakes (on car hauls) may allow trip to get out of control and wreck cars and equipment.



DRYERS

All moving parts should be lubricated frequently and properly adjusted. Check trunnions for alignment to prevent undue wear and so that overloads will not be thrown on the bearings. Keep bearings clean and replace if worn. Temperature control should be inspected for accuracy—to prevent overheating of the various parts or product, or an excessive use of fuel. Replace fans if out of balance or vibrate. Furnaces should also be checked and refractories replaced where broken.



BELT CONVEYORS

Belts under improper tension or not tracking correctly will wear rapidly. Idlers should be accurately lined up and the right amount of counterweight provided for maximum life and efficiency of belts, idlers and driving equipment.

CHAIN CONVEYORS AND ELEVATORS

Bent flights or buckets may pull chains out of line and off sprockets, wrecking conveyor elevator. It's easier to replace a few pins, bushings, links, flights, or buckets than to rebuild a wrecked machine. Proper tension in chains (not too loose or too tight) prevents many breakdowns.

How To Make Your PREPARATION EQUIPMENT LAST LONGER

● To save equipment from overloads and shocks that cause breakd it is advisable to operate as continuously and uniformly as possible th out shifts and not in intermittent spurts, at speeds much higher than capacities. Frequent and thorough inspection and lubrication will potential failures and with prompt attention to small repairs, major re ments will be averted.

Link-Belt Maintenance Parts Servic

● Obviously, delivery of maintenance parts is much slower than normal times due to material shortages. Our stocks are, therefo much smaller, and we suggest that you check your equipment n and place orders for parts likely to require early replacement as in advance as possible.

LINK-BELT COMPANY Chicago, Indianapolis, Philadelphia, Pittsburgh, W Barre, Huntington, W. Va., Denver, Kansas City, Cleveland, Detroit, St. Louis, Seattle, Toronto, Vanc

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